LEGEND

M **Matched Chemicals/Industries**

A **All Chemicals/Industries**

5 Canada and US Data Compared, 1996

Figures

Maps

LEGEND

M **Matched Chemicals/Industries**

A **All Chemicals/Industries**

Tables

LEGEND

M **Matched Chemicals/Industries**

A **All Chemicals/Industries**

Key Findings

- In both countries, the relatively few facilities reporting the largest amounts accounted for a major portion of the releases in the matched data set for 1996. The top 50 facilities in NPRI represented less than 4 percent of all NPRI facilities, but reported 58 percent of releases. The top 50 facilities in TRI, representing 0.3 percent of the TRI facilities, reported 34 percent of releases. A similar pattern prevailed in releases and transfers.
- In both NPRI and TRI, 25 chemicals with the largest amounts represented approximately nine-tenths of the releases and transfers reported. Nineteen chemicals ranked among the top 25 for total releases and transfers in both PRTRs.
- Of the 45 matched substances designated as known or suspected carcinogens, chromium and its compounds, dichloromethane and lead and its compounds ranked highest for releases and transfers in both PRTRs, although not in the same order. For releases only, dichloromethane ranked first in both NPRI and TRI, accounting for about 20 percent of carcinogen releases reported in both PRTRs.
- About one-third of the forms submitted in both PRTRs were for metals and their compounds. These substances accounted for 30 percent of all releases and transfers reported in NPRI and 25 percent in TRI. The 19 metals and their compounds accounted for a higher proportion of TRI releases (17 percent) than NPRI releases (14 percent). A larger proportion of NPRI transfers (61 percent) consisted of metals and their compounds than was the case in TRI (46 percent). In both PRTRs, zinc and manganese and their compounds ranked first and second for both releases and transfers.
- Industries reporting the largest NPRI releases and transfers were primary metals, chemical manufacturing, and paper products. In TRI, the chemical industry ranked first, followed by primary metals and paper products. Primary metal industries reported one-third of NPRI's total releases and transfers and chemical manufacturing one-third of those in TRI. The chemical industry submitted the most reporting forms (three times as many as any other industry sector) in both PRTRs.
- In 1996, NPRI facilities averaged 28,881 kg of releases and transfers per reporting form, one and one-half times the average per form in TRI of 19,019 kg.

5.1 Introduction

This chapter compares the Canadian and US data for 1996 from the matched data set. It notes significant differences and similarities between the two PRTRs, when comparable chemicals and industries are viewed for both systems.

5.2 Overview, NPRI and TRI, 1996

In both countries, releases were about twice the size of transfers in 1996. Releases were a somewhat smaller percentage of the total in NPRI (67 percent) than in TRI (71 percent), even though emissions to air—the largest type of release or transfer in both systems—were a larger percentage in NPRI (51 percent) than in TRI (45 percent). On-site land releases, however, constituted a larger portion of TRI releases and transfers (12 percent) than in NPRI (7 percent, see **Table 5–1**, p. 101 and **Figure 5–1**).

The largest differences between the two PRTRs occurred in off-site transfers. Canadian facilities reported sending much more (19 percent) of their reportable substances off-site for disposal or containment than did US facilities (11 percent). Although it is sent off-site, this material will also generally be released, usually in disposal to land. At the same time, NPRI transfers to sewage/POTWs were much lower (4 percent) than in TRI (8 percent). Thus, in part, the larger role that off-site disposal played for Canadian facilities reflected a much smaller usage of municipal sewage plants or POTWs than among US facilities. The amount of treatment that sewage plants provide for toxic substances depends on the chemical substances themselves, as well as on the treatment methods available at the sewage plant. Some portion of the PRTR chemicals in these transfers is also released (discharged to surface waters), although the release occurs off-site.

5.2.1 Top Facilities for Releases

The 50 NPRI facilities with the largest releases in the matched data set reported well above half (58 percent) of all releases in Canada. In NPRI, the top 50 facilities represented 3.7 percent of all reporting facilities, while in TRI, the top 50 represented 0.3 percent of all reporting facilities. In the United States, the top 50 TRI facilities reported one-third (34 percent) of all releases (**Figure 5–2** and **Tables 5–2**, pp. 104–5 and **5–3**, pp. 106–7).

The top NPRI facilities were much more likely to release listed substances to air than their TRI counterparts. Air emissions constituted 68 percent of releases reported by the top 50 NPRI facilities and 28 percent of releases reported by the top 50 TRI facilities. In contrast, on-site land releases were much larger for these facilities in TRI—40 percent versus 16 percent in NPRI (**Figure 5–3**).

5.2.2 Top Facilities for Releases and Transfers

Comparing total releases and transfers with large releases, releases and transfers were slightly more concentrated in the top 50 NPRI facilities but somewhat less so in the top 50 TRI facilities (compare **Figure 5–4**, drawing upon **Tables 5–4**, pp. 108–9 and **5–5**, pp. 110–11, with **Figure 5–2**). The top 50 NPRI facilities reported 59 percent of all Canadian releases and transfers, while the top 50 TRI facilities reported 28 percent of the US total.

The top NPRI facilities submitted from 2 to 23 forms (each form representing one chemical substance or group). The top TRI facilities submitted 2 to 50 forms, suggesting that some of these facilities conducted larger or more diverse operations than their Canadian counterparts.

[Text continues on p. 112.]

Figure 5–1
M 1996
Releases and Transfers by Type, NPRI and TRI

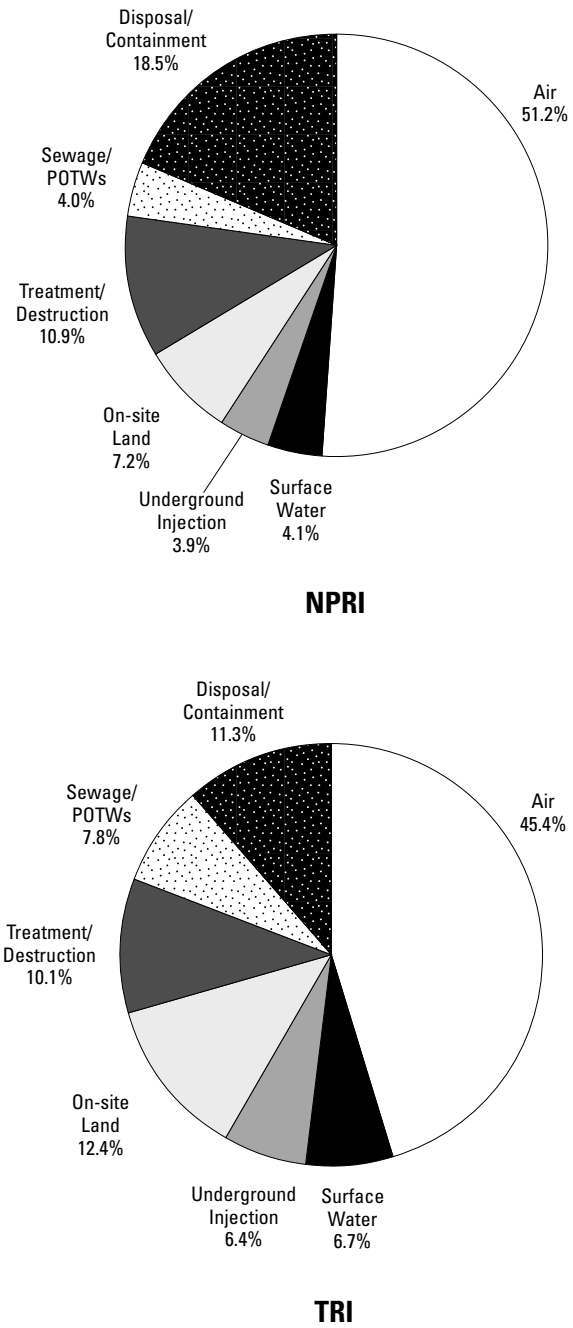


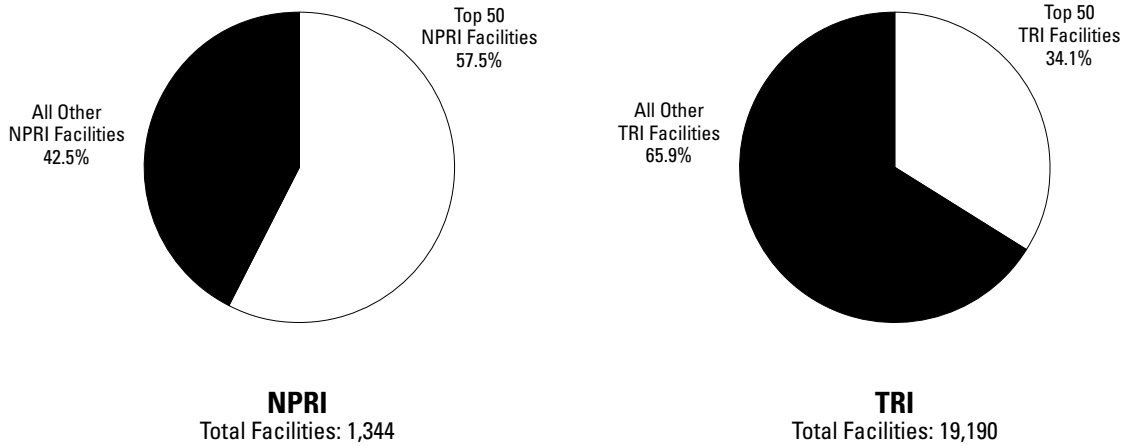
Table 5–1
M 1996

Releases and Transfers, NPRI and TRI

	NPRI		TRI	
	Number		Number	
Total Facilities	1,344		19,190	
Total Forms	4,298		57,927	
	kg	**%**	**kg**	**%**
Total Air Emissions	63,590,706	51.2	499,678,471	45.4
Surface Water Discharges	5,128,134	4.1	73,614,363	6.7
Underground Injection	4,812,379	3.9	70,427,564	6.4
On-site Land Releases	8,936,491	7.2	136,901,554	12.4
Matched Releases	**82,596,460**	**66.5**	**780,621,952**	**70.9**
Treatment/Destruction	13,571,799	10.9	110,901,271	10.1
Sewage/POTWs	4,943,234	4.0	86,130,663	7.8
Disposal/Containment	23,017,654	18.5	124,047,657	11.3
Matched Transfers	**41,532,687**	**33.5**	**321,079,591**	**29.1**
Total Releases and Transfers	**124,129,147**	**100.0**	**1,101,701,543**	**100.0**

Figure 5–2
M 1996

NPRI and TRI Total Releases, Top 50 Facilities and All Others



NPRI
Total Facilities: 1,344

TRI
Total Facilities: 19,190

Figure 5–3
M 1996

Top 50 Facilities for Total Releases, NPRI and TRI

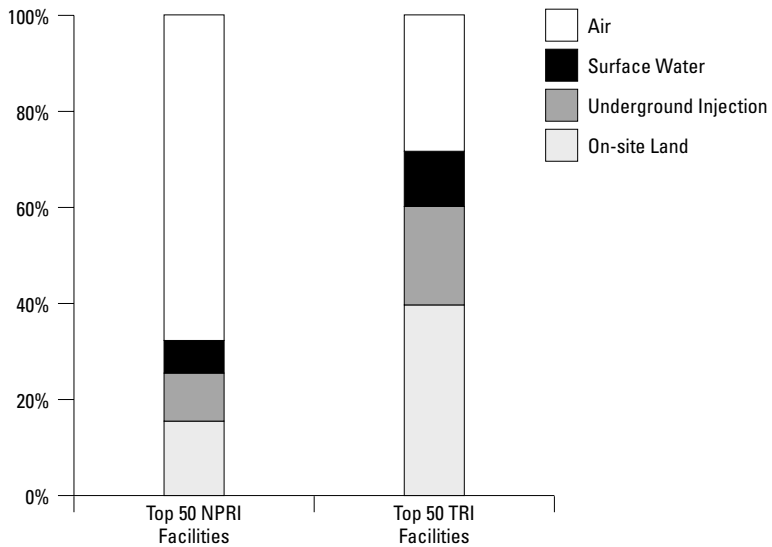


Figure 5–4
M 1996

NPRI and TRI Total Releases and Transfers, Top 50 Facilities and All Others

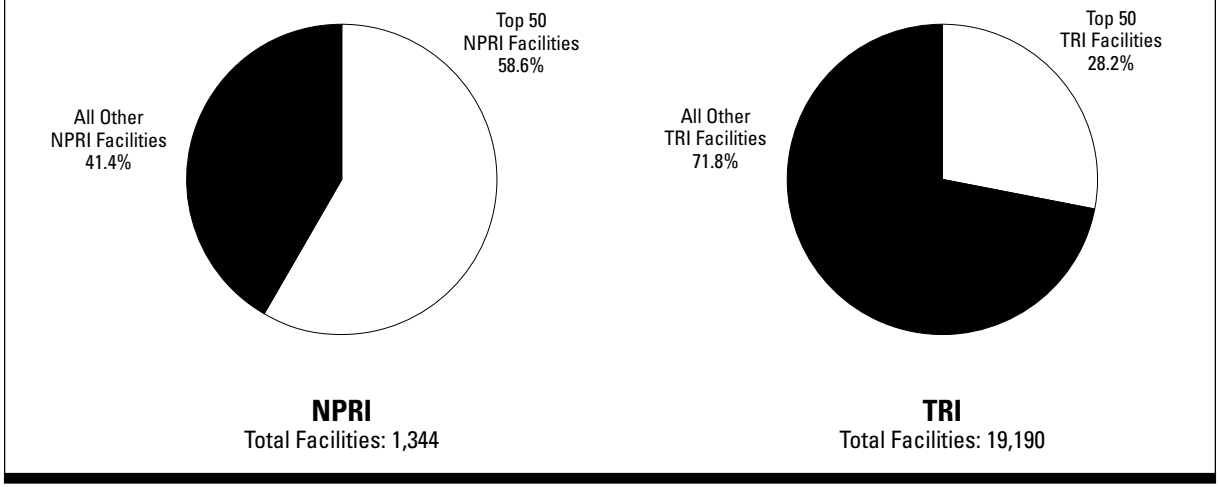


Table 5–2

M 1996

The 50 NPRI Facilities with the Largest Total Releases

Rank	Facility	City, Province	SIC Codes Canada	SIC Codes US	Number of Forms	Total Air Emissions (kg)	Surface Water Discharges (kg)	Underground Injection (kg)	On-site Land Releases (kg)
1	Inco Limited, Copper Cliff Smelter Complex	Copper Cliff, ON	29	33	7	4,773,818	0	0	0
2	Celanese Canada Inc.	Edmonton, AB	37	28	10	395,362	0	4,081,300	16,150
3	Sidbec-Dosco (Ispat) Inc., acierie	Contrecoeur, QC	29	33	5	59,400	185	0	2,263,400
4	Nova Chemicals Ltd., St. Clair Site	Corunna, ON	37	28	8	2,186,200	820	0	0
5	Irving Pulp & Paper Ltd./Irving Tissue Co.	Saint John, NB	27	26	4	249,591	1,933,834	0	0
6	Agrium Products Inc.	Fort Saskatchewan, AB	37	28	10	2,121,980	0	0	0
7	Gerdau MRM Steel Inc.	Selkirk, MB	29	33	5	22,367	0	0	2,008,700
8	Bayer Rubber Inc.	Sarnia, ON	37	28	16	1,697,761	28,065	0	0
9	Methanex Corporation	Medicine Hat, AB	37	28	3	1,453,740	0	0	340
10	Co-Steel Lasco	Whitby, ON	29	33	6	12,695	298	0	1,241,900
11	General Motors of Canada Limited, Car Plant-Autoplex	Oshawa, ON	32	37	11	1,215,563	0	0	0
12	Canadian General-Tower Ltd.	Cambridge, ON	16	30	10	998,528	0	0	0
13	Agrium Products Inc.	Redwater, AB	37	28	15	200,470	105,210	650,480	540
14	Fletcher Challenge Canada, Elk Falls Mill	Campbell River, BC	27	26	4	884,500	0	0	0
15	Daishowa Marubeni International, Peace River Div.	Peace River, AB	27	26	8	837,960	7,820	0	0
16	Avenor Inc.	Thunder Bay, ON	27	26	8	761,850	5,220	0	0
17	Morbern Incorporated	Cornwall, ON	16	30	3	746,600	0	0	0
18	Métallurgie Noranda Inc., Fonderie Horne	Rouyn-Noranda, QC	29	33	12	674,650	18,900	0	0
19	Borden Co., Sunworthy Wallcoverings	Brampton, ON	27	26	5	635,850	0	0	0
20	Skeena Cellulose Inc., Skeena Pulp Operations	Skeena, BC	27	26	4	616,600	0	0	0
21	General Motors of Canada Limited, Truck Plant-Autoplex	Oshawa, ON	32	37	11	610,549	0	0	0
22	AltaSteel Ltd.	Edmonton, AB	29	33	6	11,216	1,513	0	597,172
23	Union Carbide Canada Inc., Prentiss Ethylene Glycol Plant	Lacombe County, AB	37	28	5	605,923	0	0	0
24	Lake Erie Steel Company Ltd.	Nanticoke, ON	29	33	19	99,734	40,762	0	462,800
25	Dofasco Inc.	Hamilton, ON	29	33	18	578,783	7,559	0	99
26	Alcan Smelters and Chemicals Ltd.	Kitimat, BC	29	33	4	583,200	0	0	0
27	Standard Products (Canada) Ltd., Rubber Plant 1	Stratford, ON	15	30	3	582,700	0	0	0
28	DuPont Canada Inc.	Maitland, ON	37	28	16	180,588	395,062	0	4,000
29	Sammi Atlas Inc., Aciers inoxydables Atlas	Tracy, QC	29	33	11	24,037	539,750	0	0
30	Ford Motor Company, St. Thomas Assembly Plant	St. Thomas, ON	32	37	11	543,648	230	0	0
31	St. Anne-Nackawic Pulp Company Ltd.	Nackawic, NB	27	26	4	507,000	14,000	0	0
32	Avenor Inc., Dryden Mill	Dryden, ON	27	26	7	487,770	8,100	0	2,010
33	Imperial Oil, IOL Sarnia Refinery	Sarnia, ON	36	29	22	474,524	326	0	1,976
34	Witco Canada Inc., West Hill Plant	Scarborough, ON	36	29	2	471,000	0	0	0
35	Imperial Oil, Sarnia Chemical Plant	Sarnia, ON	37	28	23	460,062	173	0	0
36	Sidbec-Dosco (Ispat) Inc., Sidbec-Feruni (Ispat)	Contrecoeur, QC	29	33	5	0	0	0	457,180
37	Chrysler Canada, Ltd., Windsor Assembly Plant	Windsor, ON	32	37	14	453,795	0	0	0
38	Paintplas Inc.	Ajax, ON	32	30	9	447,160	0	0	0
39	Ford Motor Company, Oakville Assembly Plant	Oakville, ON	32	37	11	443,226	0	0	0
40	Weyerhaeuser Saskatchewan Ltd., Prince Albert Pulp & Paper	Prince Albert, SK	27	26	6	415,206	22,200	0	0
41	Hudson Bay Mining and Smelting Co. Ltd., Metallurgical Complex	Flin Flon, MB	29	33	6	433,765	3,327	0	0
42	Produits forestiers Donohue Inc., usine de pâte Kraft	St-Félicien, QC	27	26	7	203,700	68,800	0	145,800
43	International Wallcoverings Ltd	Brampton, ON	27	26	4	416,300	0	0	0
44	Dow Chemical Canada Inc.	Sarnia, ON	37	28	20	262,263	55	0	148,007
45	Chrysler Canada, Ltd., Bramalea Assembly Plant	Brampton, ON	32	37	12	407,240	0	0	0
46	Cartons St-Laurent Inc.	Latuque, QC	27	26	8	367,818	34,275	0	0
47	Dow Chemical Canada Inc., Western Canada Operations	Fort Saskatchewan, AB	37	28	24	398,050	1	0	2,287
48	Canfor, Prince George Pulp & Paper Mills	Prince George, BC	27	26	4	397,400	0	0	300
49	Emballages Stone Canada, Division Pontiac	Portage-du-Fort, QC	27	26	5	395,510	0	0	641
50	Canadian Fertilizers Limited	Medicine Hat, AB	37	28	3	387,735	0	0	0
	Subtotal				**454**	**32,195,387**	**3,236,485**	**4,731,780**	**7,353,302**
	% of Total				**10.6**	**50.6**	**63.1**	**98.3**	**82.3**
	Total				**4,298**	**63,590,706**	**5,128,134**	**4,812,379**	**8,936,491**

* Chemicals accounting for more than 70% of total releases from the facility.

➤ UIJ=underground injection

Rank	Total Releases (kg)	Major Chemicals Reported (Primary Media)*
1	4,773,818	Sulfuric acid (air)
2	4,492,813	Methanol, Methyl ethyl ketone (UIJ)
3	2,322,985	Zinc and compounds (land)
4	2,187,020	Cyclohexane (air)
5	2,183,425	Methanol (water)
6	2,121,980	Methanol (air)
7	2,031,067	Zinc and compounds (land)
8	1,725,826	Chloromethane, Cyclohexane, Hydrochloric acid (air)
9	1,454,080	Methanol (air)
10	1,254,893	Zinc/Lead and compounds (land)
11	1,216,263	Xylene, Toluene (air)
12	998,783	Methyl ethyl ketone (air)
13	956,800	Nitric acid and nitrate compounds (UIJ)
14	884,500	Methanol (air)
15	845,780	Methanol (air)
16	767,070	Methanol (air)
17	746,600	Methyl ethyl ketone (air)
18	693,550	Lead/Copper/Zinc and compounds (air)
19	635,850	Methyl ethyl ketone, Toluene (air)
20	616,600	Methanol, Chlorine (air)
21	610,855	Xylene, Toluene (air)
22	609,901	Zinc/Manganese and compounds (land)
23	605,923	Ethylene glycol, Ethylene (air)
24	603,307	Manganese and compounds (land)
25	586,441	Benzene (air)
26	583,200	Hydrogen fluoride (air)
27	582,700	Xylene (air)
28	579,650	Nitric acid and nitrate compounds (water), Cyclohexane (air)
29	563,787	Nitric acid and nitrate compounds (water)
30	543,878	Xylene, Methyl isobutyl ketone, Ethylbenzene (air)
31	521,000	Methanol, Chlorine, Chlorine dioxide (air)
32	497,880	Methanol (air)
33	476,826	Methyl isobutyl ketone, Vanadium, Methyl ethyl ketone, Toluene, Xylene, Ethylene (air)
34	471,000	Methanol (air)
35	460,674	Ethylene, Hydrochloric acid, Benzene (air)
36	457,180	Zinc/Lead and compounds (land)
37	453,795	Methyl ethyl ketone, Xylene, Toluene (air)
38	447,160	Xylene, Toluene (air)
39	443,226	Xylene, Methyl isobutyl ketone (air)
40	437,406	Methanol (air)
41	437,092	Zinc/Lead and compounds (air)
42	418,300	Manganese and compounds (land, water), Methanol (air)
43	416,300	Methyl ethyl ketone, Toluene (air)
44	411,891	Ethylene (air), Asbestos (land)
45	407,240	Methyl ethyl ketone, Toluene, Xylene (air)
46	402,093	Methanol (air)
47	400,338	Ethylene, Chloroethane (air)
48	397,700	Methanol (air)
49	396,151	Methanol (air)
50	387,835	Methanol (air)
	47,520,432	
	57.5	
	82,596,460	

Table 5–3

M 1996

The 50 TRI Facilities with the Largest Total Releases

Rank	Facility	City, State	SIC Code	Number of Forms	Total Air Emissions (kg)	Surface Water Discharges (kg)	Underground Injection (kg)	On-site Land Releases (kg)
1	Magnesium Corp. of America, Renco Group	Rowley, UT	33	6	29,619,647	0	0	0
2	ASARCO Inc.	East Helena, MT	33	10	53,133	926	0	20,113,824
3	Courtaulds Fibers Inc., Courtaulds Finance U.S. Inc.	Axis, AL	28	4	12,559,013	16,155	0	206,032
4	Cyprus Miami Mining, Cyprus Amax Minerals Co.	Claypool, AZ	33	13	135,775	113	0	11,298,700
5	PCS Nitrogen Fertilizer L.P., Potash Corp. of Saskatchewan	Geismar, LA	28	11	62,872	9,430,274	0	247,618
6	Cytec Industries Inc.	Westwego, LA	28	23	61,923	3,318	9,306,790	0
7	DuPont	Victoria, TX	28	29	163,006	625	8,568,203	5,420
8	Lenzing Fibers Corp.	Lowland, TN	28	5	8,208,665	3,129	0	146,077
9	Monsanto Co.	Gonzalez, FL	28	18	36,432	653	7,771,064	0
10	Northwestern Steel & Wire Co.	Sterling, IL	33	7	70,984	1,224	0	6,496,608
11	BASF Corp.	Freeport, TX	28	24	149,217	6,352,981	5,216	0
12	General Motors Corp., Powertrain Defiance	Defiance, OH	33	17	331,912	6,461	0	6,069,061
13	Armco Inc.	Butler, PA	33	14	112,906	5,444,361	0	153,788
14	Elkem Metals Co.	Marietta, OH	33	6	218,375	326,987	0	4,763,725
15	American Chrome & Chemicals, Harrisons & Crossfield	Corpus Christi, TX	28	2	2,176	703	0	5,124,724
16	ASARCO Inc., Ray Complex/Hayden Smelter	Hayden, AZ	33	9	542,461	0	0	4,555,931
17	BP Chemicals Inc.	Lima, OH	28	27	115,258	0	4,760,148	0
18	Phelps Dodge Hidalgo Inc., Phelps Dodge Corp.	Playas, NM	33	2	275,871	0	0	4,261,169
19	PCS Phosphate Co. Inc., Potash Corp. of Saskatchewan	Aurora, NC	28	6	164,776	3	0	4,196,711
20	Huntsman Petrochemical Corp., Huntsman Corp.	Port Arthur, TX	28	19	4,256,988	0	0	0
21	Kennecott Utah Copper, Kennecott Holdings Corp.	Magna, UT	33	14	97,945	2,151	0	4,139,586
22	Occidental Chemical Corp., Occidental Petroleum Corp.	Castle Hayne, NC	28	2	2,969	15	0	4,081,774
23	ASARCO Inc., Glover Plant	Annapolis, MO	33	6	158,230	35	0	3,871,968
24	DuPont	Beaumont, TX	28	19	183,382	184	3,716,892	0
25	Hoechst-Celanese Chemical, Hoechst Corp., Clear Lake Plant	Pasadena, TX	28	20	350,749	0	3,479,003	0
26	Doe Run Co., Herculaneum Smelter, Renco Group Inc.	Herculaneum, MO	33	10	106,458	149	0	3,467,234
27	FMC Corp.	Pocatello, ID	28	12	31,050	351	0	3,539,427
28	Chino Mines Co.	Hurley, NM	33	2	81,697	0	0	3,457,668
29	BP Chemicals Inc. Green Lake, BP America Inc.	Port Lavaca, TX	28	16	88,605	331	3,385,759	3,675
30	US Steel Gary Works, USX Corp.	Gary, IN	33	34	774,919	14,068	0	2,600,141
31	Eastman Kodak Co., Kodak Park	Rochester, NY	38	50	2,981,026	261,484	0	167
32	Bayer Corp.	New Martinsville, WV	28	29	120,104	3,016,805	0	317
33	Sterling Chemicals Inc.	Texas City, TX	28	36	476,419	558	2,595,334	0
34	Rubicon Inc.	Geismar, LA	28	24	135,663	72	2,903,039	0
35	PCS Phosphate, Potash Corp. of Saskatchewan	White Springs, FL	28	4	49,892	0	0	2,947,850
36	Angus Chemical Co.	Sterlington, LA	28	11	70,561	80,632	2,684,452	0
37	Coastal Chem Inc., Coastal Corp.	Cheyenne, WY	28	12	16,485	0	2,771,339	0
38	Vicksburg Chemical Co.	Vicksburg, MS	28	3	33,986	2,713,007	0	0
39	Granite City Steel, National Steel Corp.	Granite City, IL	33	22	114,722	5,616	0	2,593,382
40	IMC-Agrico Co., IMC Global Inc., Faustina Plant	Saint James, LA	28	9	79,702	2,428,338	0	178,037
41	Monsanto Co.	Luling, LA	28	13	20,699	73,261	2,579,638	0
42	BHP Copper Metals Co., BHP Copper Co.	San Manuel, AZ	33	7	1,787,997	0	0	774,034
43	International Paper	Hampton, SC	30	11	2,462,176	45	0	0
44	Tennessee Eastman, Eastman Chemical	Kingsport, TN	28	56	2,316,748	73,219	0	38,450
45	Kerr-McGee Chemical Corp. Electrolytic Plant, Kerr-McGee Corp	Hamilton, MS	Mult.	5	5,217	11,211	0	2,335,785
46	IMC-Agrico Co., New Wales Plant	Mulberry, FL	Mult.	2	61,224	0	0	1,995,468
47	Dow Chemical Co.	Freeport, TX	28	69	1,837,901	91,781	0	82,878
48	USS Fairfield Works, USX Corp.	Fairfield, AL	33	12	136,959	2,681	0	1,859,435
49	Westvaco Corp., Bleached Board Div.	Covington, VA	26	15	1,919,192	15,276	0	55,122
50	Weyerhaeuser Co.	Longview, WA	Mult.	19	1,840,777	147,261	0	0
	Subtotal			**796**	**75,484,844**	**30,526,444**	**54,526,877**	**105,661,786**
	% of Total			**1.4**	**15.1**	**41.5**	**77.4**	**77.2**
	Total			**57,927**	**499,678,471**	**73,614,363**	**70,427,564**	**136,901,554**

* Chemicals accounting for more than 70% of the total releases from the facility.

➤ Gunderson Inc., Portland, OR, reported 2.8 million kg of air emissions of manganese in error. This facility has been omitted from this table.

➤ UIJ=underground injection

Rank	Total Releases (kg)	Major Chemicals Reported (Primary Media)*
1	29,619,647	Chlorine (air)
2	20,167,883	Zinc and compounds (land)
3	12,781,200	Carbon disulfide (air)
4	11,434,588	Copper and compounds, Zinc and compounds (land)
5	9,740,764	Phosphoric acid (water)
6	9,372,031	Acetonitrile, Acrylic acid (UIJ)
7	8,737,254	Nitric acid and nitrate compounds (UIJ)
8	8,357,871	Carbon disulfide (air)
9	7,808,149	Nitric acid and nitrate compounds (UIJ)
10	6,568,816	Zinc and compounds, Manganese and compounds (land)
11	6,507,414	Nitric acid and nitrate compounds (water)
12	6,407,434	Zinc and compounds (land)
13	5,711,055	Nitric acid and nitrate compounds (water)
14	5,309,087	Manganese and compounds (land)
15	5,127,603	Chromium and compounds (land)
16	5,098,392	Copper and compounds, Zinc and compounds (land)
17	4,875,406	Acetonitrile, Acrylamide, Acrylonitrile (UIJ)
18	4,537,040	Copper and compounds (land)
19	4,361,490	Phosphoric acid (land)
20	4,256,988	Propylene (air)
21	4,239,682	Copper and compounds, Zinc and compounds (land)
22	4,084,758	Chromium and compounds (land)
23	4,030,233	Zinc and compounds, Lead and compounds (land)
24	3,900,458	Nitric acid and nitrate compounds (UIJ)
25	3,829,752	Ethylene glycol (UIJ)
26	3,573,841	Zinc and compounds (land)
27	3,570,828	Zinc and compounds, Phosphorus (land)
28	3,539,365	Copper and compounds (land)
29	3,478,370	Acetonitrile, Acrylamide, Acrylonitrile (UIJ)
30	3,389,128	Zinc and compounds, Manganese and compounds (land)
31	3,242,677	Dichloromethane, Hydrochloric acid, Methanol (air)
32	3,137,226	Nitric acid and nitrate compounds (water)
33	3,072,311	Acetonitrile, Nitric acid and nitrate compounds, Methanol, Acrylamide (UIJ)
34	3,038,774	Nitric acid and nitrate compounds, Methanol (UIJ)
35	2,997,742	Phosphoric acid (land)
36	2,835,645	Nitric acid and nitrate compounds, Formaldehyde (UIJ)
37	2,787,824	Nitric acid and nitrate compounds (UIJ)
38	2,746,993	Nitric acid and nitrate compounds (water)
39	2,713,720	Zinc and compounds (land)
40	2,686,077	Phosphoric acid (water)
41	2,673,598	Formaldehyde (UIJ)
42	2,562,031	Copper and compounds (air)
43	2,462,221	Methanol, Phenol (air)
44	2,428,417	Hydrochloric acid, Methanol, Toluene, Bromomethane, Hydrogen fluoride (air)
45	2,352,213	Manganese and compounds (land)
46	2,056,692	Phosphoric acid (land)
47	2,012,560	Ethylene, Hydrochloric acid, Propylene, Chlorine, Epichlorohydrin, 1,2-Dichloroethane (air)
48	1,999,075	Zinc and compounds (land)
49	1,989,590	Methanol, Hydrochloric acid (air)
50	1,988,038	Methanol, Acetaldehyde (air)
	266,199,951	
	34.1	
	780,621,952	

Table 5–4

M 1996

Top 50 NPRI Facilities with Largest Total Releases and Transfers

Rank	Facility	City, Province	SIC Codes Canada	SIC Codes US	Number of Forms	Total Air Emissions (kg)	Surface Water Discharges (kg)	Underground Injection (kg)	On-site Land Releases (kg)
1	Co-Steel Lasco	Whitby, ON	29	33	6	12,695	298	0	1,241,900
2	Inco Limited, Copper Cliff Smelter Complex	Copper Cliff, ON	29	33	7	4,773,818	0	0	0
3	Celanese Canada Inc.	Edmonton, AB	37	28	10	395,362	0	4,081,300	16,150
4	Lake Erie Steel Company Ltd.	Nanticoke, ON	29	33	19	99,734	40,762	0	462,800
5	Dominion Colour Corporation	Ajax, ON	37	28	6	0	0	0	0
6	Dofasco Inc.	Hamilton, ON	29	33	18	578,783	7,559	0	99
7	Stelco McMaster Ltée	Contrecoeur, QC	29	33	5	16,280	0	0	0
8	Sidbec-Dosco (Ispat) Inc., acierie	Contrecoeur, QC	29	33	5	59,400	185	0	2,263,400
9	Nova Chemicals Ltd., St. Clair Site	Corunna, ON	37	28	8	2,186,200	820	0	0
10	Irving Pulp & Paper Ltd./Irving Tissue Co.	Saint John, NB	27	26	4	249,591	1,933,834	0	0
11	Agrium Products Inc.	Fort Saskatchewan, AB	37	28	10	2,121,980	0	0	0
12	Aimco Solrec Ltd.	Milton, ON	37	28	6	33,708	0	0	0
13	Bayer Rubber Inc.	Sarnia, ON	37	28	16	1,697,761	28,065	0	0
14	Gerdau MRM Steel Inc.	Selkirk, MB	29	33	5	22,367	0	0	2,008,700
15	Fraser Papers Inc (Canada)	Edmundston, NB	27	26	9	174,150	0	0	0
16	Ivaco Rolling Mills	L'Orignal, ON	29	33	7	10,087	2	0	0
17	Methanex Corporation	Medicine Hat, AB	37	28	3	1,453,740	0	0	340
18	Slater Steels, Hamilton Specialty Bar Division	Hamilton, ON	29	33	10	8,728	0	0	200
19	General Motors of Canada Limited, Car Plant-Autoplex	Oshawa, ON	32	37	11	1,215,563	0	0	0
20	Sammi Atlas Inc., Aciers inoxydables Atlas	Tracy, QC	29	33	11	24,037	539,750	0	0
21	Agrium Products Inc.	Redwater, AB	37	28	15	200,470	105,210	650,480	540
22	Canadian General-Tower Ltd.	Cambridge, ON	16	30	10	998,528	0	0	0
23	Dominion Castings Ltd.	Hamilton, ON	29	33	4	6,291	100	0	0
24	Kronos Canada, Inc.	Varennes, QC	37	28	8	23,196	45,350	0	0
25	Fletcher Challenge Canada, Elk Falls Mill	Campbell River, BC	27	26	4	884,500	0	0	0
26	Zalev Brothers Limited	Windsor, ON	29	33	7	449	7	0	0
27	Daishowa Marubeni International, Peace River Div.	Peace River, AB	27	26	8	837,960	7,820	0	0
28	Gerdau Courtice Steel Inc., Courtice Steel Inc.	Cambridge, ON	29	33	7	12,030	0	0	0
29	Avenor Inc.	Thunder Bay, ON	27	26	8	761,850	5,220	0	0
30	Stelco Inc., Hilton Works	Hamilton, ON	29	33	21	309,840	40,875	0	690
31	Morbern Incorporated	Cornwall, ON	16	30	3	746,600	0	0	0
32	Métallurgie Noranda Inc., Fonderie Horne	Rouyn-Noranda, QC	29	33	12	674,650	18,900	0	0
33	AltaSteel Ltd.	Edmonton, AB	29	33	6	11,216	1,513	0	597,172
34	General Motors of Canada Limited, Truck Plant-Autoplex	Oshawa, ON	32	37	11	610,549	0	0	0
35	Borden Co., Sunworthy Wallcoverings	Brampton, ON	27	26	5	635,850	0	0	0
36	Les Produits chimiques Delmar Inc.	LaSalle, QC	37	28	5	63,800	0	0	0
37	Skeena Cellulose Inc., Skeena Pulp Operations	Skeena, BC	27	26	4	616,600	0	0	0
38	Union Carbide Canada Inc., Prentiss Ethylene Glycol Plant	Lacombe County, AB	37	28	5	605,923	0	0	0
39	Standard Products (Canada) Ltd., Rubber Plant 1	Stratford, ON	15	30	3	582,700	0	0	0
40	Alcan Smelters and Chemicals Ltd.	Kitimat, BC	29	33	4	583,200	0	0	0
41	DuPont Canada Inc.	Maitland, ON	37	28	16	180,588	395,062	0	4,000
42	Ford Motor Company, St. Thomas Assembly Plant	St. Thomas, ON	32	37	11	543,648	230	0	0
43	Dow Chemical Canada Inc.	Sarnia, ON	37	28	20	262,263	55	0	148,007
44	Imperial Oil, Sarnia Chemical Plant	Sarnia, ON	37	28	23	460,062	173	0	0
45	St. Anne-Nackawic Pulp Company Ltd.	Nackawic, NB	27	26	4	507,000	14,000	0	0
46	Chrysler Canada, Ltd., Windsor Assembly Plant	Windsor, ON	32	37	14	453,795	0	0	0
47	Avenor Inc., Dryden Mill	Dryden, ON	27	26	7	487,770	8,100	0	2,010
48	Imperial Oil, IOL Sarnia Refinery	Sarnia, ON	36	29	22	474,524	326	0	1,976
49	Witco Canada Inc., West Hill Plant	Scarborough, ON	36	29	2	471,000	0	0	0
50	Sammi Atlas Inc., Atlas Specialty Steels	Welland, ON	29	33	5	232	1,523	0	121,845
	Subtotal				**450**	**28,141,068**	**3,195,739**	**4,731,780**	**6,869,829**
	% of Total				**10.5**	**44.3**	**62.3**	**98.3**	**76.9**
	Total				**4,298**	**63,590,706**	**5,128,134**	**4,812,379**	**8,936,491**

* Chemicals accounting for more than 70% of total releases and transfers from the facility.

➤ UIJ=underground injection

Rank	Total Releases (kg)	Treatment/ Destruction (kg)	Sewage/ POTW (kg)	Disposal/ Containment (kg)	Total Transfers (kg)	Total Releases and Transfers (kg)	Major Chemicals Reported (Primary Media/Transfers)*
1	1,254,893	0	10	3,578,500	3,578,510	4,833,403	Zinc and compounds (transfers to disposal)
2	4,773,818	0	0	0	0	4,773,818	Sulfuric acid (air)
3	4,492,813	0	0	48,855	48,855	4,541,668	Methanol, Methyl ethyl ketone (UIJ)
4	603,307	0	0	3,814,700	3,814,700	4,418,007	Manganese and compounds (transfers to disposal)
5	50	0	3,870,000	229,400	4,099,400	4,099,450	Nitric acid and nitrate compounds (transfers to sewage)
6	586,441	6,000	1,692	2,539,200	2,546,892	3,133,333	Zinc/Manganese and compounds (transfers to disposal)
7	17,410	3,054,700	0	0	3,054,700	3,072,110	Zinc and compounds (transfers to treatment)
8	2,322,985	0	0	0	0	2,322,985	Zinc and compounds (land)
9	2,187,020	21,450	0	7,650	29,100	2,216,120	Cyclohexane (air)
10	2,183,425	0	0	0	0	2,183,425	Methanol (water)
11	2,121,980	20,114	0	2,200	22,314	2,144,294	Methanol (air)
12	33,708	2,100,316	0	0	2,100,316	2,134,024	Xylene, Toluene (transfers to treatment)
13	1,725,826	320,517	0	79,723	400,240	2,126,066	Cyclohexane, Chloromethane, Hydrochloric acid (air)
14	2,031,067	0	0	0	0	2,031,067	Zinc and compounds (land)
15	174,150	1,388,969	0	160,181	1,549,150	1,723,300	Methanol (transfers to treatment)
16	11,020	0	0	1,559,360	1,559,360	1,570,380	Zinc and compounds (transfers to disposal)
17	1,454,080	0	3,920	0	3,920	1,458,000	Methanol (air)
18	10,528	542	12,365	1,256,701	1,269,608	1,280,136	Zinc/, Lead and compounds (transfers to disposal)
19	1,216,263	4,423	35	3,952	8,410	1,224,673	Xylene, Toluene (air)
20	563,787	513,110	0	0	513,110	1,076,897	Nitric acid and nitrate compounds (water), Chromium and compounds (transfers to treatment)
21	956,800	20,200	0	34,810	55,010	1,011,810	Nitric acid and nitrate compounds (UIJ)
22	998,783	117	0	83	200	998,983	Methyl ethyl ketone (air)
23	6,591	0	0	906,005	906,005	912,596	Chromium and compounds (transfers to disposal)
24	68,546	0	0	836,000	836,000	904,546	Manganese and compounds (transfers to disposal)
25	884,500	0	0	0	0	884,500	Methanol (air)
26	456	0	0	877,606	877,606	878,062	Zinc/Copper and compounds (transfers to disposal)
27	845,780	0	0	0	0	845,780	Methanol (air)
28	12,030	0	10,750	776,670	787,420	799,450	Zinc/Lead and compounds (transfers to disposal)
29	767,070	0	0	0	0	767,070	Methanol (air)
30	352,705	37,000	88,000	272,640	397,640	750,345	Asbestos (transfers to disposal), Benzene (air), Phenol (transfers to sewage)
31	746,600	0	0	0	0	746,600	Methyl ethyl ketone (air)
32	693,550	0	0	0	0	693,550	Lead/Copper/Zinc and compounds (air)
33	609,901	0	1,476	67,244	68,720	678,621	Zinc/Manganese and compounds (land)
34	610,855	0	22,302	6,740	29,042	639,897	Xylene, Toluene, Methyl isobutyl ketone (air)
35	635,850	0	2,700	0	2,700	638,550	Methyl ethyl ketone, Toluene (air)
36	63,800	572,400	0	0	572,400	636,200	Toluene, Isopropyl alcohol (transfers to treatment)
37	616,600	0	0	0	0	616,600	Methanol, Chlorine (air)
38	605,923	0	0	2,100	2,100	608,023	Ethylene glycol, Ethylene (air)
39	582,700	2,200	0	14,900	17,100	599,800	Xylene (air)
40	583,200	0	0	0	0	583,200	Hydrogen fluoride (air)
41	579,650	0	0	0	0	579,650	Nitric acid and nitrate compounds (water), Cyclohexane (air)
42	543,878	5,130	0	11,106	16,236	560,114	Xylene, Methyl isobutyl ketone, Ethylbenzene, n-Butyl alcohol (air)
43	411,891	131,155	0	0	131,155	543,046	Ethylene (air), Asbestos, Benzene (land)
44	460,674	0	0	75,798	75,798	536,472	Ethylene, Hydrochloric acid (air), Asbestos (transfers to disposal)
45	521,000	0	0	0	0	521,000	Methanol, Chlorine, Chlorine dioxide (air)
46	453,795	0	24,656	21,725	46,381	500,176	Methyl ethyl ketone, Xylene, Toluene (air)
47	497,880	0	0	0	0	497,880	Methanol (air)
48	476,826	2,043	0	17,095	19,138	495,964	Methyl isobutyl ketone, Vanadium, Methyl ethyl ketone, Toluene, Xylene, Ethylene, Propylene (air)
49	471,000	0	15,000	0	15,000	486,000	Methanol (air)
50	123,600	8,348	0	353,753	362,100	485,700	Chromium and compounds (transfers to disposal, land), Zinc and compounds (transfers to disposal)
	42,947,005	**8,208,734**	**4,052,906**	**17,554,697**	**29,816,336**	**72,763,341**	
	52.0	**60.5**	**82.0**	**76.3**	**71.8**	**58.6**	
	82,596,460	**13,571,799**	**4,943,234**	**23,017,654**	**41,532,687**	**124,129,147**	

Table 5–5

M 1996

Top 50 TRI Facilities with Largest Total Releases and Transfers

Rank	Facility	City, State	SIC Code	Number of Forms	Total Air Emissions (kg)	Surface Water Discharges (kg)	Underground Injection (kg)	On-site Land Releases (kg)
1	Magnesium Corp. of America, Renco Group	Rowley, UT	33	6	29,619,647	0	0	0
2	ASARCO Inc.	East Helena, MT	33	10	53,133	926	0	20,113,824
3	Courtaulds Fibers Inc., Courtaulds Finance U.S. Inc.	Axis, AL	28	4	12,559,013	16,155	0	206,032
4	Cyprus Miami Mining, Cyprus Amax Minerals Co.	Claypool, AZ	33	13	135,775	113	0	11,298,700
5	Zinc Corp. of America, Horsehead Industries Inc.	Monaca, PA	33	9	219,985	272	0	0
6	PCS Nitrogen Fertilizer L.P., Potash Corp. of Saskatchewan	Geismar, LA	28	11	62,872	9,430,274	0	247,618
7	Cytec Industries Inc.	Westwego, LA	28	23	61,923	3,318	9,306,790	0
8	DuPont	Victoria, TX	28	29	163,006	625	8,568,203	5,420
9	Air Products & Chemicals Inc.	Pasadena, TX	28	10	29,344	0	0	0
10	Lenzing Fibers Corp.	Lowland, TN	28	5	8,208,665	3,129	0	146,077
11	ASARCO Inc., Ray Complex/Hayden Smelter	Hayden, AZ	33	9	542,461	0	0	4,555,931
12	Monsanto Co.	Gonzalez, FL	28	18	36,432	653	7,771,064	0
13	Nucor Steel, Nucor Corp.	Crawfordsville, IN	33	9	5,069	26	0	10
14	National Steel Corp., Great Lakes Div.	Ecorse, MI	33	17	85,676	499,858	0	0
15	BASF Corp.	Freeport, TX	28	24	149,217	6,352,981	5,216	0
16	Northwestern Steel & Wire Co.	Sterling, IL	33	7	70,984	1,224	0	6,496,608
17	General Motors Corp., Powertrain Defiance	Defiance, OH	33	17	331,912	6,461	0	6,069,061
18	Rouge Steel Co.	Dearborn, MI	33	7	23,355	2,630	0	0
19	Armco Inc.	Butler, PA	33	14	112,906	5,444,361	0	153,788
20	Elkem Metals Co.	Marietta, OH	33	6	218,375	326,987	0	4,763,725
21	American Chrome & Chemicals, Harrisons & Crossfield	Corpus Christi, TX	28	2	2,176	703	0	5,124,724
22	CPI, Consolidated Papers Inc.	Wisconsin Rapids, WI	26	12	1,167,213	113	0	0
23	BP Chemicals Inc.	Lima, OH	28	27	115,258	0	4,760,148	0
24	Kennecott Utah Copper, Kennecott Holdings Corp.	Magna, UT	33	14	97,945	2,151	0	4,139,586
25	Phelps Dodge Hidalgo Inc., Phelps Dodge Corp.	Playas, NM	33	2	275,871	0	0	4,261,169
26	PCS Phosphate Co. Inc., Potash Corp. of Saskatchewan	Aurora, NC	28	6	164,776	3	0	4,196,711
27	Huntsman Petrochemical Corp., Huntsman Corp.	Port Arthur, TX	28	19	4,256,988	0	0	0
28	DuPont	Beaumont, TX	28	19	183,382	184	3,716,892	0
29	Pharmacia & Upjohn Co.	Portage, MI	28	23	141,111	67,803	1,565,804	0
30	Occidental Chemical Corp., Occidental Petroleum Corp.	Castle Hayne, NC	28	2	2,969	15	0	4,081,774
31	Hoechst-Celanese Chemical, Hoechst Corp., Clear Lake Plant	Pasadena, TX	28	20	350,749	0	3,479,003	0
32	ASARCO Inc., Glover Plant	Annapolis, MO	33	6	158,230	35	0	3,871,968
33	Warner-Lambert Co., Parke-Davis Div.	Holland, MI	28	12	80,292	0	875,518	0
34	Regal Ware Inc.	Kewaskum, WI	34	6	474	0	0	0
35	Doe Run Co., Herculaneum Smelter, Renco Group Inc.	Herculaneum, MO	33	10	106,458	149	0	3,467,234
36	FMC Corp.	Pocatello, ID	28	12	31,050	351	0	3,539,427
37	Chino Mines Co.	Hurley, NM	33	2	81,697	0	0	3,457,668
38	Boise Cascade Corp.	Saint Helens, OR	26	8	227,512	0	0	0
39	Ameristeel Corp., Jacksonville Mill Div.	Baldwin, FL	33	6	8,662	0	0	0
40	BP Chemicals Inc. Green Lake, BP America Inc.	Port Lavaca, TX	28	16	88,605	331	3,385,759	3,675
41	Cerro Wire & Cable Co. Inc.	Hartselle, AL	33	3	120	6	0	0
42	U.S. Steel Gary Works, USX Corp.	Gary, IN	33	34	774,919	14,068	0	2,600,141
43	Eastman Kodak Co., Kodak Park	Rochester, NY	38	50	2,981,026	261,484	0	167
44	USS Mon Valley Works Edgar Thomson Plant, USX Corp.	Braddock, PA	33	7	15,004	971	0	0
45	Bayer Corp.	New Martinsville, WV	28	29	120,104	3,016,805	0	317
46	Hercules Inc.	Hopewell, VA	28	12	317,461	0	0	0
47	Sterling Chemicals Inc.	Texas City, TX	28	36	476,419	558	2,595,334	0
48	Keystone Steel & Wire Co., Keystone Consolidated Industries	Peoria, IL	33	4	607,486	542	0	165,402
49	Rubicon Inc.	Geismar, LA	28	24	135,663	72	2,903,039	0
50	Stone Container Corp.	Panama City, FL	26	10	736,833	0	0	53,416
	Subtotal			**681**	**66,396,203**	**25,456,337**	**48,932,770**	**93,020,173**
	% of Total			**1.2**	**13.3**	**34.6**	**69.5**	**67.9**
	Total			**57,927**	**499,678,471**	**73,614,363**	**70,427,564**	**136,901,554**

* Chemicals accounting for more than 70% of the total releases and transfers from the facility.

➤ Thomson Consumer Electronics, Dunmore, PA, reported 3.1 million kg of transfers to disposal of lead compounds in error. The facility has been omitted from this table.

➤ UIJ=underground Injection

Rank	Total Releases (kg)	Treatment/ Destruction (kg)	Sewage/ POTW (kg)	Disposal/ Containment (kg)	Total Transfers (kg)	Total Releases and Transfers (kg)	Major Chemicals Reported (Primary Media/Transfers)*
1	29,619,647	0	0	0	0	29,619,647	Chlorine (air)
2	20,167,883	0	15	0	15	20,167,898	Zinc and compounds (land)
3	12,781,200	0	0	0	0	12,781,200	Carbon disulfide (air)
4	11,434,588	0	0	0	0	11,434,588	Copper and compounds, Zinc and compounds (land)
5	220,257	48,557	0	10,424,975	10,473,532	10,693,789	Zinc and compounds, Manganese and compounds (transfers to disposal)
6	9,740,764	0	0	524	524	9,741,288	Phosphoric acid (water)
7	9,372,031	3,469	0	6,553	10,022	9,382,053	Acetonitrile, Acrylic acid (UIJ)
8	8,737,254	478,515	0	0	478,515	9,215,769	Nitric acid and nitrate compounds (UIJ)
9	29,344	6,499	8,338,137	0	8,344,636	8,373,980	Nitric acid and nitrate compounds (transfers to sewage)
10	8,357,871	0	0	0	0	8,357,871	Carbon disulfide (air)
11	5,098,392	3,033,408	127	0	3,033,535	8,131,927	Lead and compounds (transfers to treatment), Copper/Zinc and compounds (land)
12	7,808,149	0	0	2,168	2,168	7,810,317	Nitric acid and nitrate compounds (UIJ)
13	5,105	392	0	7,659,066	7,659,458	7,664,563	Zinc and compounds (transfers to disposal)
14	585,534	64,010	10,955	6,299,311	6,374,276	6,959,810	Zinc and compounds (transfers to disposal)
15	6,507,414	120,545	0	11,067	131,612	6,639,026	Nitric acid and nitrate compounds (water)
16	6,568,816	65,170	0	0	65,170	6,633,986	Zinc and compounds, Manganese and compounds (land)
17	6,407,434	2,350	1,266	0	3,616	6,411,050	Zinc and compounds (land)
18	25,985	0	0	5,933,588	5,933,588	5,959,573	Zinc and compounds (transfers to disposal)
19	5,711,055	0	0	0	0	5,711,055	Nitric acid and nitrate compounds (water)
20	5,309,087	0	0	43,538	43,538	5,352,625	Manganese and compounds (land)
21	5,127,603	24,036	0	3,129	27,165	5,154,768	Chromium and compounds (land)
22	1,167,326	3,755,293	0	0	3,755,293	4,922,619	Methanol (transfers to treatment)
23	4,875,406	10,929	0	630	11,559	4,886,965	Acetonitrile, Acrylamide, Acrylonitrile (UIJ)
24	4,239,682	0	0	347,303	347,303	4,586,985	Copper and compounds, Zinc and compounds (land)
25	4,537,040	0	0	0	0	4,537,040	Copper and compounds (land)
26	4,361,490	0	0	0	0	4,361,490	Phosphoric acid (land)
27	4,256,988	20,581	0	11,517	32,098	4,289,086	Propylene (air)
28	3,900,458	271,136	0	12,890	284,026	4,184,484	Nitric acid and nitrate compounds (UIJ)
29	1,774,718	1,739,283	603,207	6,937	2,349,427	4,124,145	Methanol (UIJ), Dichloromethane (transfers to treatment)
30	4,084,758	4,535	0	0	4,535	4,089,293	Chromium and compounds (land)
31	3,829,752	15,328	200,266	41,544	257,138	4,086,890	Ethylene glycol (UIJ)
32	4,030,233	0	0	0	0	4,030,233	Zinc/Lead and compounds (land)
33	955,810	2,784,589	0	5	2,784,594	3,740,404	Methanol, Toluene (transfers to treatment, UIJ)
34	474	0	0	3,646,276	3,646,276	3,646,750	Aluminum oxide (transfers to disposal)
35	3,573,841	0	451	0	451	3,574,292	Zinc and compounds (land)
36	3,570,828	0	3	792	795	3,571,623	Zinc and compounds, Phosphorus (land)
37	3,539,365	0	0	0	0	3,539,365	Copper and compounds (land)
38	227,512	0	3,295,111	1,682	3,296,793	3,524,305	Methanol (transfers to sewage)
39	8,662	1,756,108	0	1,756,111	3,512,219	3,520,881	Zinc and compounds (transfers to treatment and to disposal)
40	3,478,370	12,310	0	0	12,310	3,490,680	Acetonitrile, Acrylamide, Acrylonitrile (UIJ)
41	126	0	0	3,440,012	3,440,012	3,440,138	Copper and compounds (transfers to disposal)
42	3,389,128	0	0	45,387	45,387	3,434,515	Zinc and compounds, Manganese and compounds (land)
43	3,242,677	137,186	571	11,545	149,302	3,391,979	Dichloromethane, Hydrochloric acid, Methanol (air)
44	15,975	0	0	3,260,898	3,260,898	3,276,873	Zinc and compounds (transfers to disposal)
45	3,137,226	1,397	0	19,860	21,257	3,158,483	Nitric acid and nitrate compounds (water)
46	317,461	0	2,839,848	0	2,839,848	3,157,309	Nitric acid and nitrate compounds, Ethylene glycol (transfers to sewage)
47	3,072,311	43,013	397	9,320	52,730	3,125,041	Acetonitrile, Nitric acid and nitrate compounds, Methanol, Acrylamide (UIJ)
48	773,430	2,351,091	0	0	2,351,091	3,124,521	Zinc and compounds (transfers to treatment)
49	3,038,774	9,453	0	12,606	22,059	3,060,833	Nitric acid and nitrate compounds, Methanol (UIJ)
50	790,249	0	2,268,082	0	2,268,082	3,058,331	Methanol (transfers to sewage)
	233,805,483	**16,759,183**	**17,558,436**	**43,009,234**	**77,326,853**	**311,132,336**	
	30.0	**15.1**	**20.4**	**34.7**	**24.1**	**28.2**	
	780,621,952	**110,901,271**	**86,130,663**	**124,047,657**	**321,079,591**	**1,101,701,543**	

5.3 Geographic Distribution

In both Canada and the United States, 50 facilities accounted for a large portion of the releases and 50 for a large portion of releases and transfers reported in 1996 to their respective PRTRs. Seven of the 10 Canadian provinces and 23 of the 53 US states and territories contained at least one of these facilities (**Maps 5–1** and **5–2**).

5.3.1 Top Facilities for Releases

Twenty-five of the top 50 NPRI facilities for releases were located in the province of Ontario, and they reported 58 percent of the province's releases. In three provinces—Alberta, Manitoba and New Brunswick—the top facilities reported more than 80 percent of all releases in the province (**Table 5–6**, p. 115).

The top 50 facilities for releases in the United States were less concentrated geographically than those in Canada. The state of Texas had nine of the top US facilities, and neighboring Louisiana had six. Both states are located on the Gulf of Mexico. Another 21 states also had one or more of the top facilities for releases. In five western states—Arizona, Montana, New Mexico, Utah and Wyoming—the facilities ranking among the top 50 nationally accounted for 80 percent or more of all releases from those states (**Tables 5–3**, pp. 106–7 and **5–7**, p. 116, **Map 5–1**).

5.3.2 Top Facilities for Releases and Transfers

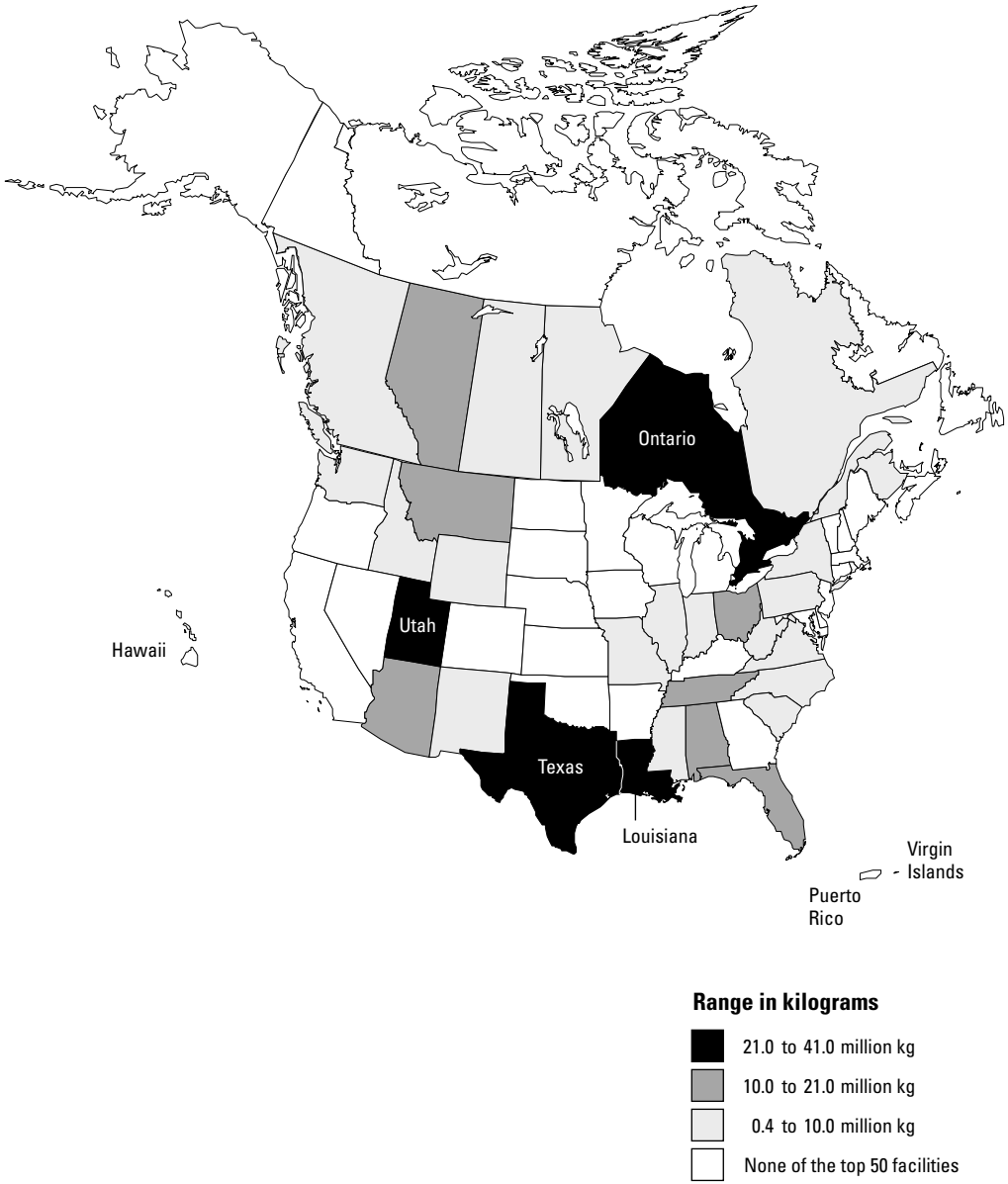
More than half of the top 50 facilities with the largest releases and transfers in Canada were located in Ontario: 30 of the top 50, out of a total of 733 Ontario facilities in the matched data set. These 30 facilities reported nearly two-thirds of the province's total releases and transfers. In contrast, six of Quebec's 336 facilities ranked among the top 50, and their NPRI reports amounted to 38 percent of Quebec's releases and transfers (**Tables 5–4**, pp. 108–9 and **5–8**, p. 117, **Map 5–2**).

Texas had nine of the top 50 TRI facilities for total releases and transfers (all but one were the same facilities as for total releases). Because of their relatively large transfers, four of the top 50 facilities for total releases and transfers were located in Michigan, a state with none of the top 50 facilities for total releases alone (**Table 5–9**, p. 118 and **Map 5–2**).

[Text continues on p. 119.]

Map 5–1
M 1996

States and Provinces with Top 50 Facilities for North American Releases



Map 5–2
M 1996

States and Provinces with Top 50 Facilities for North American Releases and Transfers

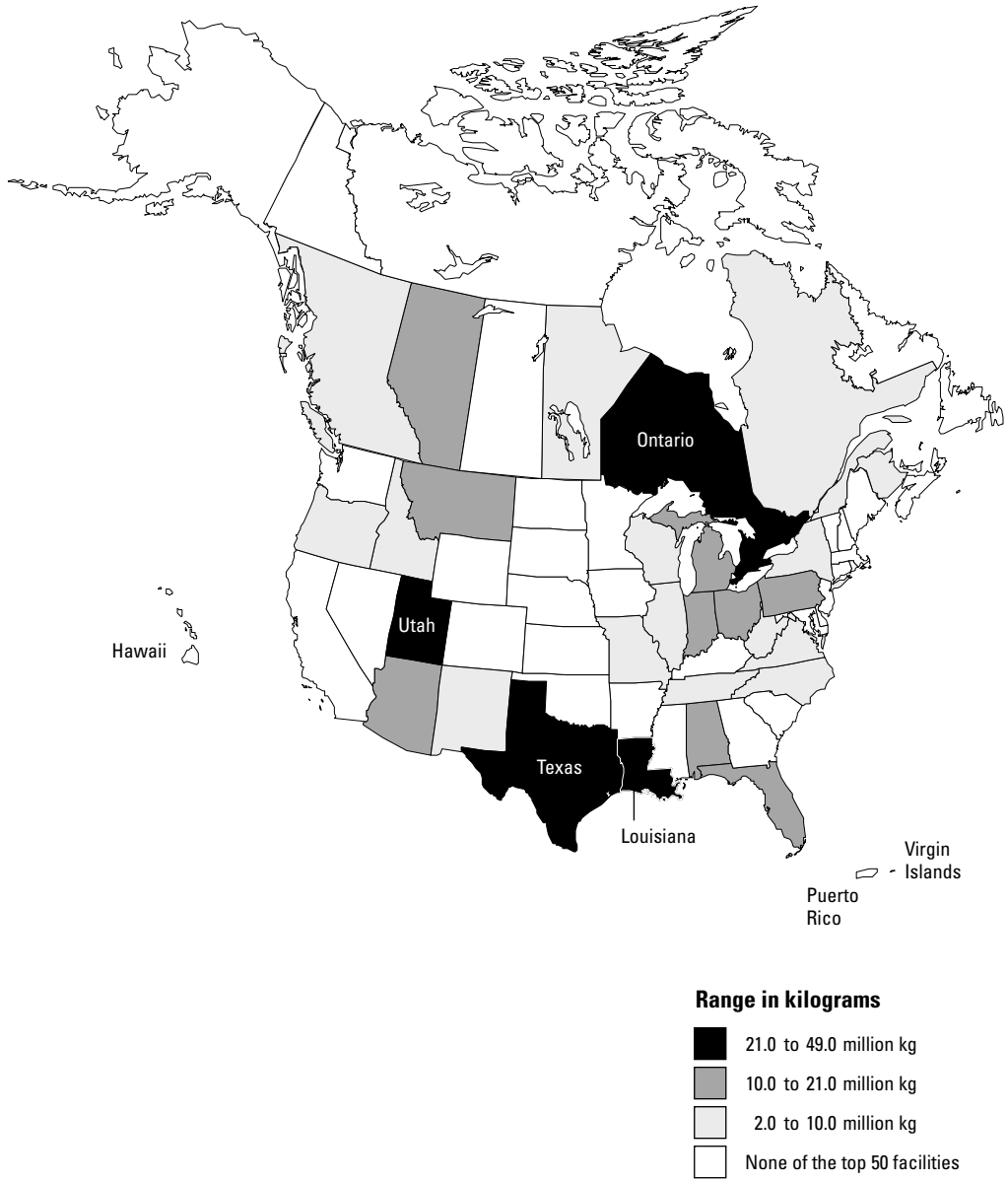


Table 5–6

M 1996

The 50 NPRI Facilities with the Largest Total Releases, by Province

		All NPRI Facilities		Top 50 Facilities		Top 50 Facilities as % All Facilities	
Rank	Province	Number of Facilities	Total Releases (kg)	Number of Facilities	Total Releases (kg)	Facilities (%)	Total Releases (%)
1	Ontario	733	38,711,456	25	22,298,946	3.4	57.6
2	Quebec	336	14,732,567	7	5,254,046	2.1	35.7
3	Alberta	96	14,621,572	9	11,875,450	9.4	81.2
4	British Columbia	70	5,710,382	4	2,482,000	5.7	43.5
5	New Brunswick	21	3,277,331	2	2,704,425	9.5	82.5
6	Manitoba	39	3,062,727	2	2,468,159	5.1	80.6
7	Nova Scotia	25	1,278,806	0	0	0.0	0.0
8	Saskatchewan	15	783,366	1	437,406	6.7	55.8
9	Newfoundland	7	400,700	0	0	0.0	0.0
10	Prince Edward Island	2	17,553	0	0	0.0	0.0
	Total	**1,344**	**82,596,460**	**50**	**47,520,432**	**3.7**	**57.5**

Table 5–7

M 1996

Top 50 TRI Facilities with Largest Releases, by State

State	All TRI Facilities		Top 50 Facilities		Top 50 Facilities as % All Facilities	
	Number of Facilities	Total Releases (kg)	Number of Facilities	Total Releases (kg)	Facilities (%)	Total Releases (%)
Texas	1,074	92,003,220	9	40,922,646	0.8	44.5
Louisiana	269	64,174,124	6	30,346,774	2.2	47.3
Ohio	1,462	40,039,996	3	16,591,914	0.2	41.4
Utah	128	36,400,466	2	33,859,344	1.6	93.0
Alabama	443	36,057,848	2	14,780,280	0.5	41.0
Tennessee	574	35,719,754	2	10,786,299	0.3	30.2
Illinois	1,165	33,027,544	2	9,282,522	0.2	28.1
North Carolina	769	30,841,068	2	8,446,238	0.3	27.4
Pennsylvania	1,083	27,501,052	1	5,711,006	0.1	20.8
Florida	447	26,649,236	3	12,862,574	0.7	48.3
Indiana	936	26,508,110	1	3,389,128	0.1	12.8
Michigan	795	22,389,445	0	0	0.0	0.0
Missouri	499	21,577,853	2	7,604,064	0.4	35.2
Montana	21	21,426,762	1	20,167,858	4.8	94.1
Arizona	172	20,648,276	3	19,094,990	1.7	92.5
Mississippi	274	20,414,695	2	5,099,177	0.7	25.0
Georgia	623	20,151,598	0	0	0.0	0.0
Virginia	395	19,742,050	1	1,989,589	0.3	10.1
South Carolina	439	19,028,607	1	2,462,222	0.2	12.9
Kentucky	380	12,713,763	0	0	0.0	0.0
New York	614	12,296,245	1	3,242,679	0.2	26.4
Oregon	222	11,873,289	0	0	0.0	0.0
Wisconsin	801	11,826,236	0	0	0.0	0.0
California	1,137	10,432,858	0	0	0.0	0.0
Arkansas	334	9,983,507	0	0	0.0	0.0
West Virginia	121	9,898,444	1	3,137,201	0.8	31.7
Washington	249	9,108,344	1	1,988,038	0.4	21.8
New Mexico	31	8,917,115	2	8,076,396	6.5	90.6
Iowa	353	8,421,028	0	0	0.0	0.0
Kansas	253	6,575,123	0	0	0.0	0.0
Minnesota	434	6,312,325	0	0	0.0	0.0
Oklahoma	261	5,913,300	0	0	0.0	0.0
New Jersey	514	5,441,829	0	0	0.0	0.0
Idaho	49	5,259,373	1	3,570,824	2.0	67.9
Maryland	162	4,168,265	0	0	0.0	0.0
Wyoming	25	3,314,989	1	2,787,823	4.0	84.1
Maine	73	3,129,685	0	0	0.0	0.0
Puerto Rico	140	3,027,614	0	0	0.0	0.0
Connecticut	285	2,638,903	0	0	0.0	0.0
Massachusetts	428	2,434,807	0	0	0.0	0.0
Nebraska	137	2,320,000	0	0	0.0	0.0
South Dakota	60	2,094,078	0	0	0.0	0.0
Nevada	42	1,464,414	0	0	0.0	0.0
Colorado	151	1,445,862	0	0	0.0	0.0
Delaware	62	1,051,473	0	0	0.0	0.0
Alaska	8	1,039,885	0	0	0.0	0.0
Rhode Island	125	971,547	0	0	0.0	0.0
New Hampshire	98	874,422	0	0	0.0	0.0
Virgin Islands	2	561,766	0	0	0.0	0.0
North Dakota	29	452,299	0	0	0.0	0.0
Vermont	32	187,807	0	0	0.0	0.0
Hawaii	9	169,656	0	0	0.0	0.0
District of Columbia	1	0	0	0	0.0	—
Total	**19,190**	**780,621,952**	**50**	**266,199,585**	**0.3**	**34.1**

Table 5–8
M 1996

The 50 NPRI Facilities with the Largest Total Releases and Transfers, by Province

		All NPRI Facilities		Top 50 Facilities		Top 50 Facilities as % All Facilities	
Rank	Province	Number of Facilities	Total Releases and Transfers (kg)	Number of Facilities	Total Releases and Transfers (kg)	Facilities (%)	Total Releases and Transfers (%)
1	Ontario	733	68,763,262	30	44,225,765	4.1	64.3
2	Quebec	336	22,940,209	6	8,706,288	1.8	38.0
3	Alberta	96	15,174,849	7	11,288,196	7.3	74.4
4	British Columbia	70	6,271,403	3	2,084,300	4.3	33.2
5	New Brunswick	21	4,852,765	3	4,427,725	14.3	91.2
6	Manitoba	39	3,308,100	1	2,031,067	2.6	61.4
7	Nova Scotia	25	1,600,964	0	0	0.0	0.0
8	Saskatchewan	15	799,321	0	0	0.0	0.0
9	Newfoundland	7	400,708	0	0	0.0	0.0
10	Prince Edward Island	2	17,553	0	0	0.0	0.0
	Total	**1,344**	**124,129,147**	**50**	**72,763,341**	**3.7**	**58.6**

Table 5–9

M 1996

Top 50 TRI Facilities with Largest Releases and Transfers, by State

State	All TRI Facilities		Top 50 Facilities		Top 50 Facilities as % All Facilities	
	Number of Facilities	Total Releases and Transfers (kg)	Number of Facilities	Total Releases and Transfers (kg)	Facilities (%)	Total Releases and Transfers (%)
Texas	1,074	122,292,324	9	48,559,509	0.8	39.7
Louisiana	269	67,921,157	3	22,184,090	1.1	32.7
Ohio	1,462	65,938,375	3	16,650,629	0.2	25.3
Pennsylvania	1,083	61,451,832	3	19,681,601	0.3	32.0
Michigan	795	50,084,864	4	20,783,844	0.5	41.5
Tennessee	574	46,502,196	1	8,357,878	0.2	18.0
Illinois	1,165	45,852,410	2	9,758,493	0.2	21.3
Indiana	936	45,448,692	2	11,099,041	0.2	24.4
Alabama	443	44,698,332	2	16,221,330	0.5	36.3
Utah	128	39,127,123	2	34,206,646	1.6	87.4
North Carolina	769	36,794,390	2	8,450,773	0.3	23.0
Florida	447	34,623,617	3	14,389,476	0.7	41.6
Missouri	499	28,183,720	2	7,604,516	0.4	27.0
Virginia	395	27,126,134	1	3,157,262	0.3	11.6
Wisconsin	801	26,292,731	2	8,569,340	0.2	32.6
South Carolina	439	26,106,525	0	0	0.0	0.0
Arizona	172	24,789,458	2	19,566,488	1.2	78.9
Georgia	623	24,543,082	0	0	0.0	0.0
Mississippi	274	21,956,131	0	0	0.0	0.0
Montana	21	21,451,550	1	20,167,875	4.8	94.0
California	1,137	20,263,904	0	0	0.0	0.0
New York	614	19,878,148	1	3,391,982	0.2	17.1
Oregon	222	18,401,102	1	3,524,251	0.5	19.2
Kentucky	380	17,247,741	0	0	0.0	0.0
New Jersey	514	16,983,534	0	0	0.0	0.0
Arkansas	334	13,260,690	0	0	0.0	0.0
Iowa	353	13,079,861	0	0	0.0	0.0
West Virginia	121	12,992,851	1	3,158,459	0.8	24.3
Washington	249	10,778,446	0	0	0.0	0.0
Kansas	253	10,685,022	0	0	0.0	0.0
Minnesota	434	10,063,445	0	0	0.0	0.0
New Mexico	31	9,126,514	2	8,076,396	6.5	88.5
Massachusetts	428	8,138,712	0	0	0.0	0.0
Oklahoma	261	8,006,662	0	0	0.0	0.0
Maryland	162	7,447,639	0	0	0.0	0.0
Puerto Rico	140	6,476,130	0	0	0.0	0.0
Connecticut	285	6,046,770	0	0	0.0	0.0
Idaho	49	5,393,039	1	3,571,620	2.0	66.2
Nebraska	137	4,204,339	0	0	0.0	0.0
Maine	73	3,821,350	0	0	0.0	0.0
Wyoming	25	3,330,182	0	0	0.0	0.0
South Dakota	60	2,721,267	0	0	0.0	0.0
Delaware	62	2,658,011	0	0	0.0	0.0
Colorado	151	2,594,241	0	0	0.0	0.0
Nevada	42	1,511,093	0	0	0.0	0.0
Rhode Island	125	1,351,424	0	0	0.0	0.0
New Hampshire	98	1,286,954	0	0	0.0	0.0
Alaska	8	1,039,945	0	0	0.0	0.0
Virgin Islands	2	732,949	0	0	0.0	0.0
North Dakota	29	511,257	0	0	0.0	0.0
Vermont	32	310,375	0	0	0.0	0.0
Hawaii	9	173,191	0	0	0.0	0.0
District of Columbia	1	115	0	0	0.0	0.0
Total	**19,190**	**1,101,701,543**	**50**	**311,131,499**	**0.3**	**28.2**

5.4 Chemical Distribution

In both countries, two dozen chemicals constituted the great majority of releases and transfers in the matched data set for 1996.

Top Chemicals for Releases

The top 25 chemicals for total releases in NPRI and the analogous group in TRI represented about nine-tenths of the respective PRTRs' releases in the matched data set (**Tables 5–10**, p. 122 and **5–11**, p. 123).

In both countries, the top 25 chemicals represented a higher percentage of surface water discharges than of other environmental releases. In NPRI, the top chemicals amounted to 96 percent of the releases to surface waters. In TRI, the percentage for the top chemicals was even higher: 99 percent. The top 25 chemicals were least dominant in underground injection in the United States (81 percent of all underground injection) and in on-site land releases in Canada (87 percent of all on-site land releases).

Twenty of the top 25 chemicals for total releases were the same in both systems, including four of the top five chemicals. Methanol ranked first in both NPRI and TRI. Methanol was more dominant in NPRI reporting, with about 25 percent of both total releases and releases to air. In TRI, methanol accounted for 14 percent of total releases and 19 percent of air emissions. Other chemicals that appeared in the top five in both lists were toluene, xylene, and zinc and its compounds (**Figure 5–5**).

The NPRI and TRI top chemicals generally determined the pattern of releases in each PRTR, as well as the differences between the two. For the other chemical substances and groups in the matched data set, the distribution of releases was quite different, both within NPRI and TRI and between them. For example, NPRI facilities reported a smaller percentage of air emissions for the chemicals that were not in the top 25, while TRI facilities reported a larger percentage (**Figure 5–6**, see also **Tables 5–10**, p. 122 and **5–11**, p. 123).

Top Chemicals for Transfers

The top 25 chemicals for total transfers represented 98 percent of all transfers reported to NPRI in the 1996 matched data set. In TRI, the top 25 chemicals amounted to 91 percent of all transfers. NPRI's top chemicals accounted for more than 96 percent of all three types of transfers. TRI reporting showed a somewhat greater range, from 83 percent of transfers to treatment/destruction to 97 percent of transfers to disposal/containment (**Tables 5–12**, p. 124 and **5–13**, p. 125).

Twenty-one of the top 25 chemicals for total transfers were the same in NPRI and TRI, including the top five in both PRTRs. Zinc and its compounds led both lists, accounting for 30 percent of all NPRI transfers and 21 percent of those in TRI (**Figure 5–7**).

In both countries, facilities transferred the largest amounts of the top 25 chemicals to disposal/containment. The top 25 chemicals for transfers in NPRI were more likely to be sent to disposal/containment than those in TRI. In NPRI, 56 percent of the top chemicals were transferred to disposal/containment, compared to 41 percent in TRI. NPRI facilities were much less likely than TRI facilities to transfer the top chemicals to sewage treatment plants (sewage/POTWs); these destinations received 12 percent of NPRI transfers and 27 percent of TRI transfers of the top chemicals (**Figure 5–8**).

Top Chemicals for Releases and Transfers

The top 25 chemicals for total releases and transfers represented 92 percent of all releases and transfers reported in NPRI and 88 percent of those in TRI in the 1996 matched data set, although the two lists of top chemicals differ somewhat. Nineteen chemicals ranked among the top 25 in both PRTRs (**Tables 5–14**, p. 126 and **5–15**, p. 127).

Considerable overlap characterizes the ranking of chemicals for individual types of releases or transfers. The top 10 chemicals in each of the seven release and transfer categories added to a total of 30 chemicals in NPRI and 35 in TRI (of a possible maximum of 70 chemicals in each case). In NPRI, methanol and zinc and its compounds each ranked first in three of the release/transfer types. In TRI, zinc and its compounds ranked first in three categories, while methanol and nitric acid and nitrate compounds each ranked first in two categories (**Tables 5–16**, p. 132 and **5–17**, p. 133).

[Text continues on p. 129.]

Figure 5–5
M 1996
Top Five Chemicals for Total Releases, NPRI and/or TRI

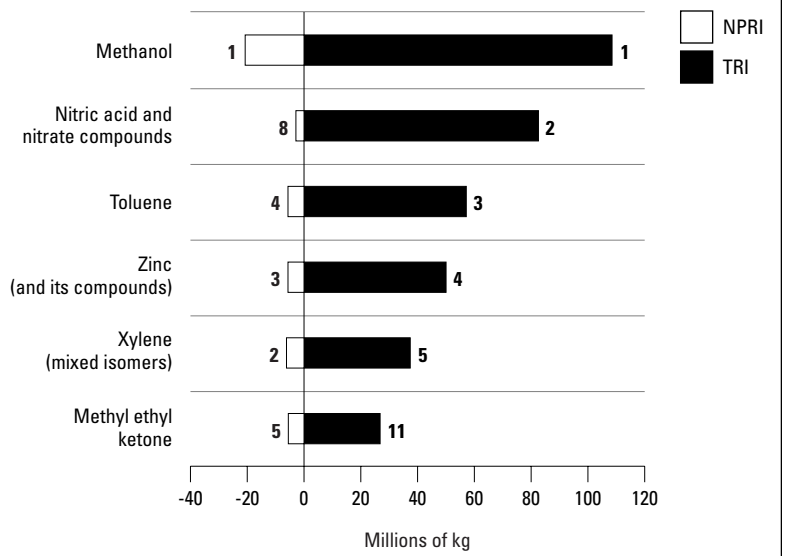


Figure 5–6
M 1996

NPRI and TRI Total Releases, Top 25 Chemicals and All Others

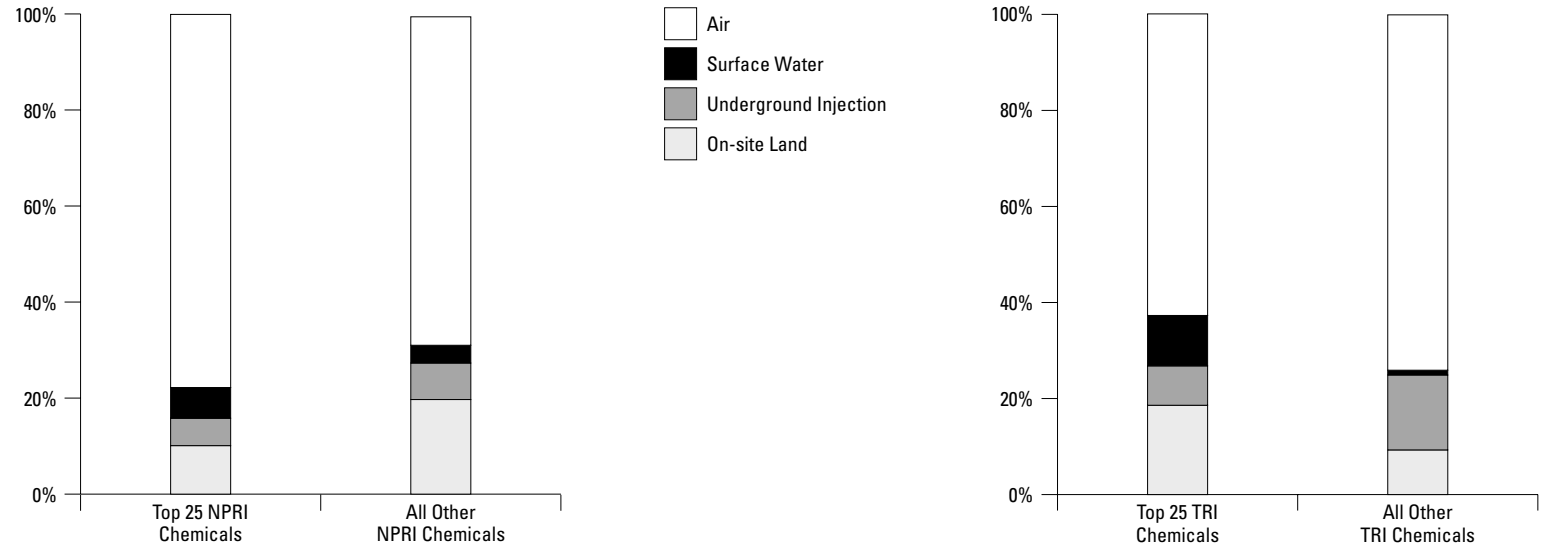


Figure 5–7
M 1996

Top Five Chemicals for Total Transfers, NPRI and/or TRI

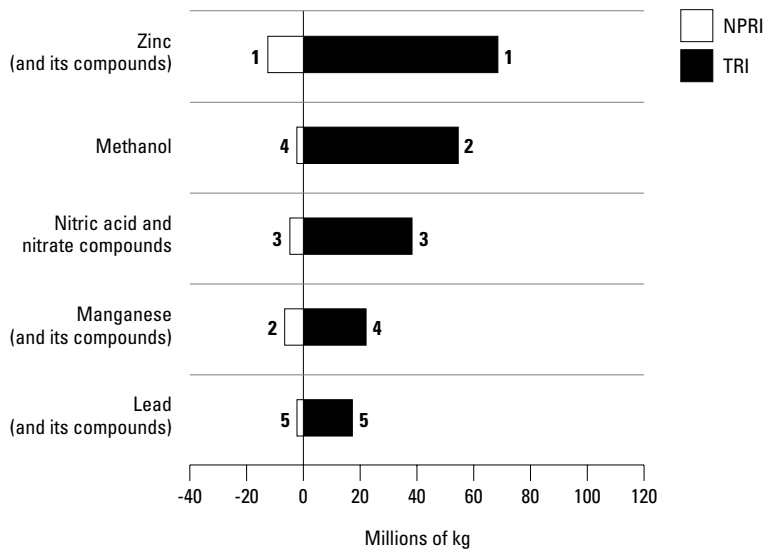


Figure 5–8
M 1996

NPRI and TRI Total Transfers, Top 25 Chemicals and All Others

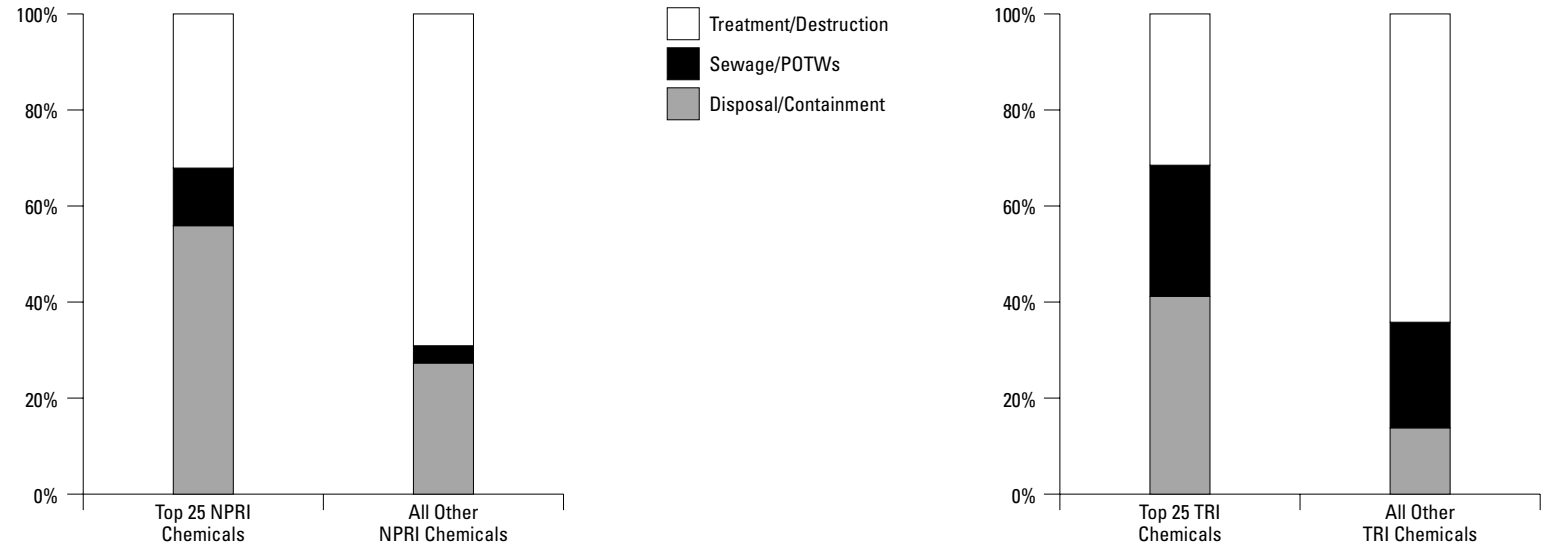


Table 5–10

M 1996

The 25 NPRI Chemicals with the Largest Total Releases

Rank	CAS Number	Chemical	Total Air Emissions (kg)	Surface Water Discharges (kg)	Underground Injection (kg)	On-site Land Releases (kg)	Total Releases (kg)	% of Total
1	67-56-1	Methanol	15,986,271	2,171,829	2,520,000	43,206	20,728,580	25.1
2	1330-20-7	Xylene (mixed isomers)	6,128,003	1,625	11,866	22,938	6,173,036	7.5
3	—	Zinc (and its compounds)	616,629	105,297	334	4,918,575	5,648,068	6.8
4	108-88-3	Toluene	5,567,523	6,612	19,899	44,912	5,647,128	6.8
5	78-93-3	Methyl ethyl ketone	4,417,901	300	1,100,000	2,181	5,527,348	6.7
6	7664-93-9	Sulfuric acid	4,925,552	0	0	0	4,925,552	6.0
7	110-82-7	Cyclohexane	2,972,491	1,009	10	988	2,974,623	3.6
8	—	Nitric acid and nitrate compounds	100,994	2,113,407	602,580	40,712	2,859,435	3.5
9	74-85-1	Ethylene	2,243,568	0	484	0	2,246,030	2.7
10	75-09-2	Dichloromethane	2,195,732	0	0	49	2,198,402	2.7
11	—	Manganese (and its compounds)	63,939	231,904	0	1,577,548	1,882,245	2.3
12	7664-39-3	Hydrogen fluoride	1,819,963	0	0	540	1,820,510	2.2
13	71-43-2	Benzene	1,723,715	943	42,971	29,119	1,796,748	2.2
14	50-00-0	Formaldehyde	1,110,808	233,253	52,580	150	1,399,467	1.7
15	—	Lead (and its compounds)	560,640	6,124	45	820,693	1,393,051	1.7
16	7647-01-0	Hydrochloric acid	1,312,809	0	0	0	1,312,809	1.6
17	10049-04-4	Chlorine dioxide	1,169,215	0	0	0	1,169,215	1.4
18	71-36-3	n-Butyl alcohol	1,102,434	21	0	30	1,108,007	1.3
19	115-07-1	Propylene	993,949	0	484	0	995,162	1.2
20	7782-50-5	Chlorine	881,704	17,853	0	0	904,783	1.1
21	100-42-5	Styrene	859,930	30	468	202	866,408	1.0
22	79-01-6	Trichloroethylene	836,512	46	0	0	837,692	1.0
23	108-10-1	Methyl isobutyl ketone	748,383	47	0	29	749,618	0.9
24	—	Copper (and its compounds)	431,233	14,263	10	234,312	684,293	0.8
25	74-87-3	Chloromethane	648,500	5	0	0	648,505	0.8
		Subtotal	**59,418,398**	**4,904,568**	**4,351,731**	**7,736,184**	**76,496,715**	**92.6**
		% of Total NPRI Releases	**93.4**	**95.6**	**90.4**	**86.6**	**92.6**	
		Total NPRI Releases	**63,590,706**	**5,128,134**	**4,812,379**	**8,936,491**	**82,596,460**	**100.0**

Table 5–11

M 1996

The 25 TRI Chemicals with the Largest Total Releases

Rank	CAS Number	Chemical	Total Air Emissions (kg)	Surface Water Discharges (kg)	Underground Injection (kg)	On-site Land Releases (kg)	Total Releases (kg)	% of Total
1	67-56-1	Methanol	93,496,105	3,333,141	10,794,152	875,299	108,498,698	13.9
2	—	Nitric acid and nitrate compounds	1,554,400	53,482,386	25,797,068	1,736,834	82,570,687	10.6
3	108-88-3	Toluene	56,718,683	31,041	149,218	250,435	57,149,376	7.3
4	—	Zinc (and its compounds)	3,387,061	488,278	58,729	46,096,185	50,030,253	6.4
5	1330-20-7	Xylene (mixed isomers)	37,309,630	17,983	59,343	22,994	37,409,950	4.8
6	75-15-0	Carbon disulfide	33,007,810	30,184	1,718	122	33,039,834	4.2
7	7782-50-5	Chlorine	30,115,374	172,201	33,649	141,784	30,463,008	3.9
8	7647-01-0	Hydrochloric acid	28,660,546	0	0	0	28,660,546	3.7
9	—	Manganese (and its compounds)	4,064,808	915,423	8,025	22,761,845	27,750,101	3.6
10	7664-38-2	Phosphoric acid	475,185	12,864,958	4,406	14,267,901	27,612,450	3.5
11	78-93-3	Methyl ethyl ketone	26,501,738	33,895	196,268	63,310	26,795,211	3.4
12	—	Copper (and its compounds)	3,122,784	48,981	154,070	23,317,789	26,643,624	3.4
13	75-09-2	Dichloromethane	23,853,107	4,558	339,912	2,121	24,199,698	3.1
14	100-42-5	Styrene	18,936,497	5,834	103,545	119,995	19,165,872	2.5
15	74-85-1	Ethylene	16,191,119	11,441	0	127	16,202,687	2.1
16	—	Chromium (and its compounds)	403,529	322,479	16,976	12,199,556	12,942,540	1.7
17	115-07-1	Propylene	11,962,800	3,235	0	775	11,966,810	1.5
18	71-36-3	n-Butyl alcohol	10,309,596	28,089	1,112,021	2,782	11,452,488	1.5
19	75-05-8	Acetonitrile	458,701	5,397	10,352,250	22	10,816,370	1.4
20	79-01-6	Trichloroethylene	9,625,277	245	585	8,227	9,634,334	1.2
21	50-00-0	Formaldehyde	5,145,781	145,126	4,264,524	51,885	9,607,316	1.2
22	7664-93-9	Sulfuric acid	8,805,762	0	0	0	8,805,762	1.1
23	108-10-1	Methyl isobutyl ketone	8,526,649	10,235	73,469	2,203	8,612,556	1.1
24	—	Lead (and its compounds)	817,653	28,045	360	6,791,505	7,637,563	1.0
25	107-21-1	Ethylene glycol	2,708,590	779,183	3,491,415	185,375	7,164,563	0.9
		Subtotal	**436,159,184**	**72,762,340**	**57,011,705**	**128,899,067**	**694,832,296**	**89.0**
		% of TRI Total	**87.3**	**98.8**	**81.0**	**94.2**	**89.0**	
		Total TRI Releases	**499,678,471**	**73,614,363**	**70,427,564**	**136,901,554**	**780,621,952**	**100.0**

Table 5–12

M 1996

The 25 NPRI Chemicals with the Largest Transfers

Rank	CAS Number	Chemical	Treatment/ Destruction (kg)	Sewage/ POTW (kg)	Disposal/ Containment (kg)	Total Transfers (kg)	% of Total
1	—	Zinc (and its compounds)	2,809,386	11,090	9,694,801	12,515,277	30.1
2	—	Manganese (and its compounds)	515,746	4,147	6,070,014	6,589,907	15.9
3	—	Nitric acid and nitrate compounds	49,304	4,585,037	118,754	4,753,095	11.4
4	67-56-1	Methanol	2,084,674	43,104	168,856	2,296,634	5.5
5	—	Lead (and its compounds)	196,217	2,376	2,057,027	2,255,620	5.4
6	—	Chromium (and its compounds)	575,785	7,318	1,670,586	2,253,689	5.4
7	1330-20-7	Xylene (mixed isomers)	1,984,173	96	45,409	2,029,678	4.9
8	108-88-3	Toluene	1,728,768	1,270	24,011	1,754,049	4.2
9	1332-21-4	Asbestos (friable)	0	0	917,016	917,016	2.2
10	78-93-3	Methyl ethyl ketone	821,930	72	6,687	828,689	2.0
11	—	Copper (and its compounds)	88,681	4,495	658,035	751,211	1.8
12	108-95-2	Phenol	276,018	101,260	285,493	662,771	1.6
13	107-21-1	Ethylene glycol	384,848	56,750	80,276	521,874	1.3
14	—	Nickel (and its compounds)	216,967	11,427	272,761	501,155	1.2
15	7664-38-2	Phosphoric acid	47,537	22,357	330,110	400,004	1.0
16	71-36-3	n-Butyl alcohol	374,201	10,309	3,841	388,351	0.9
17	50-00-0	Formaldehyde	217,333	51,999	33,382	302,714	0.7
18	100-42-5	Styrene	192,604	237	62,264	255,105	0.6
19	7429-90-5	Aluminum (fume or dust)	0	1,360	216,873	218,233	0.5
20	110-82-7	Cyclohexane	198,973	0	52	199,025	0.5
21	1344-28-1	Aluminum oxide (fibrous forms)	28	0	118,472	118,500	0.3
22	75-05-8	Acetonitrile	110,700	0	0	110,700	0.3
23	75-09-2	Dichloromethane	85,222	4,800	300	90,322	0.2
24	108-10-1	Methyl isobutyl ketone	80,461	0	1,171	81,632	0.2
25	71-43-2	Benzene	74,026	21	724	74,771	0.2
		Subtotal	**13,113,582**	**4,919,525**	**22,836,915**	**40,870,022**	**98.4**
		% of NPRI Total	**96.6**	**99.5**	**99.2**	**98.4**	
		Total NPRI Transfers	**13,571,799**	**4,943,234**	**23,017,654**	**41,532,687**	**100.0**

Table 5–13
M 1996

The 25 TRI Chemicals with the Largest Transfers

Rank	CAS Number	Chemical	Treatment/ Destruction (kg)	Sewage/ POTWs (kg)	Disposal/ Containment (kg)	Total Transfers (kg)	% of Total
1	—	Zinc (and its compounds)	19,512,938	194,100	48,800,815	68,507,854	21.3
2	67-56-1	Methanol	16,881,112	37,021,162	640,291	54,542,565	17.0
3	—	Nitric acid and nitrate compounds	7,633,649	28,778,509	1,856,059	38,268,216	11.9
4	—	Manganese (and its compounds)	3,475,948	179,423	18,426,293	22,081,664	6.9
5	—	Lead (and its compounds)	6,383,793	21,542	10,841,028	17,246,363	5.4
6	—	Copper (and its compounds)	1,410,033	238,345	9,714,108	11,362,486	3.5
7	107-21-1	Ethylene glycol	2,693,619	7,522,386	1,134,737	11,350,741	3.5
8	108-88-3	Toluene	9,986,929	272,022	482,663	10,741,614	3.3
9	—	Chromium (and its compounds)	1,791,866	134,465	7,562,568	9,488,899	3.0
10	75-09-2	Dichloromethane	5,344,261	290,380	868,408	6,503,050	2.0
11	—	Nickel (and its compounds)	1,326,369	81,408	3,723,600	5,131,377	1.6
12	1344-28-1	Aluminum oxide (fibrous forms)	16,469	602	4,242,086	4,259,157	1.3
13	1330-20-7	Xylene (mixed isomers)	3,613,112	221,244	225,364	4,059,721	1.3
14	7429-90-5	Aluminum (fume or dust)	68,763	5,784	3,513,816	3,588,363	1.1
15	108-95-2	Phenol	1,610,449	1,487,206	458,678	3,556,333	1.1
16	7664-38-2	Phosphoric acid	823,271	1,245,140	1,043,546	3,111,958	1.0
17	100-42-5	Styrene	1,243,597	119,942	1,470,682	2,834,221	0.9
18	78-93-3	Methyl ethyl ketone	2,183,464	271,347	134,527	2,589,338	0.8
19	—	Antimony (and its compounds)	409,215	53,041	2,004,228	2,466,484	0.8
20	75-05-8	Acetonitrile	1,691,405	409,410	248,614	2,349,428	0.7
21	71-36-3	n-Butyl alcohol	549,014	844,797	143,121	1,536,932	0.5
22	1332-21-4	Asbestos (friable)	34	341	1,503,906	1,504,281	0.5
23	—	Arsenic (and its compounds)	822,904	241	563,941	1,387,086	0.4
24	7664-39-3	Hydrogen fluoride	935,985	152,593	250,816	1,339,395	0.4
25	108-90-7	Chlorobenzene	1,271,215	3,691	58,202	1,333,108	0.4
		Subtotal	**91,679,415**	**79,549,122**	**119,912,098**	**291,140,634**	**90.7**
		% of TRI Total	**82.7**	**92.4**	**96.7**	**90.7**	
		Total TRI Transfers	**110,901,271**	**86,130,663**	**124,047,657**	**321,079,591**	**100.0**

Table 5–14

M 1996

The 25 NPRI Chemicals with the Largest Total Releases and Transfers

Rank	CAS Number	Chemical	Number of Forms	Total Releases (kg)	Total Transfers (kg)	Total Releases and Transfers (kg)	% of Total
1	67-56-1	Methanol	244	20,728,580	2,296,634	23,025,214	18.5
2	—	Zinc (and its compounds)	307	5,648,068	12,515,277	18,163,345	14.6
3	—	Manganese (and its compounds)	233	1,882,245	6,589,907	8,472,152	6.8
4	1330-20-7	Xylene (mixed isomers)	228	6,173,036	2,029,678	8,202,714	6.6
5	—	Nitric acid and nitrate compounds	124	2,859,435	4,753,095	7,612,530	6.1
6	108-88-3	Toluene	229	5,647,128	1,754,048	7,401,176	6.0
7	78-93-3	Methyl ethyl ketone	129	5,527,348	828,689	6,356,037	5.1
8	7664-93-9	Sulfuric acid	70	4,925,552	0	4,925,552	4.0
9	—	Lead (and its compounds)	130	1,393,051	2,255,620	3,648,671	2.9
10	110-82-7	Cyclohexane	32	2,974,623	199,025	3,173,648	2.6
11	—	Chromium (and its compounds)	213	493,593	2,253,689	2,747,282	2.2
12	75-09-2	Dichloromethane	50	2,198,402	90,322	2,288,724	1.8
13	74-85-1	Ethylene	39	2,246,030	179	2,246,209	1.8
14	71-43-2	Benzene	43	1,796,748	74,771	1,871,519	1.5
15	7664-39-3	Hydrogen fluoride	30	1,820,510	74	1,820,584	1.5
16	50-00-0	Formaldehyde	84	1,399,467	302,714	1,702,181	1.4
17	71-36-3	n-Butyl alcohol	77	1,108,007	388,350	1,496,357	1.2
18	—	Copper (and its compounds)	225	684,293	751,211	1,435,504	1.2
19	7647-01-0	Hydrochloric acid	71	1,312,809	0	1,312,809	1.1
20	10049-04-4	Chlorine dioxide	42	1,169,215	0	1,169,215	0.9
21	100-42-5	Styrene	73	866,408	255,105	1,121,513	0.9
22	1332-21-4	Asbestos (friable)	32	155,193	917,016	1,072,209	0.9
23	107-21-1	Ethylene glycol	141	517,959	521,874	1,039,833	0.8
24	115-07-1	Propylene	34	995,162	0	995,162	0.8
25	108-95-2	Phenol	59	320,882	662,771	983,653	0.8
		Subtotal	**2,939**	**74,843,744**	**39,440,049**	**114,283,793**	**92.1**
		% of Total	**68.4**	**90.6**	**95.0**	**92.1**	
		Total NPRI Releases and Transfers	**4,298**	**82,596,460**	**41,532,687**	**124,129,147**	

Table 5–15
M 1996

The 25 TRI Chemicals with the Largest Total Releases and Transfers

Rank	CAS Number	Chemical	Number of Forms	Total Releases (kg)	Total Transfers (kg)	Total Releases and Transfers (kg)	% of Total
1	67-56-1	Methanol	2,296	108,498,698	54,542,565	163,041,263	14.8
2	—	Nitric acid and nitrate compounds	2,524	82,570,687	38,268,216	120,838,902	11.0
3	—	Zinc (and its compounds)	2,932	50,030,253	68,507,854	118,538,107	10.8
4	108-88-3	Toluene	3,155	57,149,376	10,741,614	67,890,990	6.2
5	—	Manganese (and its compounds)	2,554	27,750,101	22,081,664	49,831,765	4.5
6	1330-20-7	Xylene (mixed isomers)	3,015	37,409,950	4,059,721	41,469,671	3.8
7	—	Copper (and its compounds)	4,061	26,643,624	11,362,486	38,006,110	3.4
8	75-15-0	Carbon disulfide	93	33,039,834	152,506	33,192,340	3.0
9	7782-50-5	Chlorine	1,266	30,463,008	680,364	31,143,372	2.8
10	7664-38-2	Phosphoric acid	2,669	27,612,450	3,111,958	30,724,408	2.8
11	75-09-2	Dichloromethane	888	24,199,698	6,503,050	30,702,748	2.8
12	78-93-3	Methyl ethyl ketone	2,062	26,795,211	2,589,338	29,384,550	2.7
13	7647-01-0	Hydrochloric acid	890	28,660,546	0	28,660,546	2.6
14	—	Lead (and its compounds)	1,640	7,637,562	17,246,363	24,883,926	2.3
15	—	Chromium (and its compounds)	3,154	12,942,540	9,488,899	22,431,439	2.0
16	100-42-5	Styrene	1,465	19,165,872	2,834,221	22,000,093	2.0
17	107-21-1	Ethylene glycol	1,240	7,164,563	11,350,741	18,515,305	1.7
18	74-85-1	Ethylene	292	16,202,687	505,892	16,708,579	1.5
19	75-05-8	Acetonitrile	100	10,816,370	2,349,428	13,165,798	1.2
20	71-36-3	n-Butyl alcohol	1,028	11,452,488	1,536,932	12,989,420	1.2
21	115-07-1	Propylene	338	11,966,810	127,269	12,094,079	1.1
22	50-00-0	Formaldehyde	765	9,607,316	1,324,117	10,931,433	1.0
23	79-01-6	Trichloroethylene	657	9,634,334	792,953	10,427,288	0.9
24	108-10-1	Methyl isobutyl ketone	897	8,612,556	708,730	9,321,287	0.8
25	108-95-2	Phenol	743	5,323,154	3,556,333	8,879,487	0.8
		Subtotal	**40,724**	**691,349,688**	**274,423,214**	**965,772,906**	**87.7**
		% of Total	**70.3**	**88.6**	**85.5**	**87.7**	
		Total TRI Releases and Transfers	**57,927**	**780,621,952**	**321,079,591**	**1,101,701,543**	**100.0**

5.4.1 Carcinogens

The International Agency for Research on Cancer <http://www.iarc.fr> and the US National Toxicological Program <http://ntp-server.niehs.nih.gov> evaluate chemical substances for their cancer-causing potential. Forty-five substances in the matched data set have been designated as known or suspected carcinogens by one or both of these agencies.

Releases of Carcinogens

In 1996, NPRI facilities reported releasing 11 million kg of substances designated as known or suspected carcinogens, while TRI facilities reported 115 million kg of such releases. These represented comparable percentages of total releases—13 percent of all releases in NPRI and 15 percent in TRI. In both NPRI and TRI, dichloromethane ranked first for carcinogen releases (principally air emissions), accounting for about 20 percent of carcinogen releases reported in both PRTRs (**Tables 5–18**, p. 134 and **5–19**, p. 135).

Emissions to air were the most common release of designated carcinogens in both PRTRs—79 percent of the NPRI releases and 71 percent of the TRI releases (**Figure 5–9**).

Transfers of Carcinogens

In 1996, NPRI transfers of substances designated as known or suspected carcinogens totaled 7 million kg, and TRI transfers of these substances totaled 56 million kg. As with carcinogen releases, the transfers represented comparable percentages of total transfers in the two PRTRs—17 percent of all transfers. Lead and its compounds ranked first for carcinogen transfers in both NPRI and TRI, and the largest amounts were transferred to disposal/containment. Lead and its compounds accounted for nearly one-third of the carcinogen transfers in both PRTRs (**Tables 5–20**, p. 136 and **5–21**, p. 137).

Disposal/containment was the most common disposition of carcinogen transfers in both PRTRs. This was especially true in NPRI, where 74 percent of the transfers of carcinogens were sent for disposal/containment. In TRI, 52 percent of the carcinogen transfers were directed to disposal/containment (**Figure 5–10**).

Releases and Transfers of Carcinogens

Releases and transfers of known or suspected carcinogens totaled 18 million kg in NPRI and 171 million kg in TRI for the matched data set for 1996. NPRI facilities reported 40 of the 45 designated carcinogens, and TRI facilities reported 44 of these substances. Chromium and its compounds, dichloromethane and lead and its compounds ranked highest for releases and transfers of carcinogens in both PRTRs, although in different order (**Tables 5–22**, p. 138 and **5–23**, p. 139).

Although one-fourth of the forms submitted in both NPRI and TRI were for the designated carcinogens, releases and transfers of these substances amounted to approximately 15 percent of all releases and transfers reported in each PRTR.

Figure 5–9
M 1996
NPRI and TRI Releases of Known or Suspected Carcinogens†

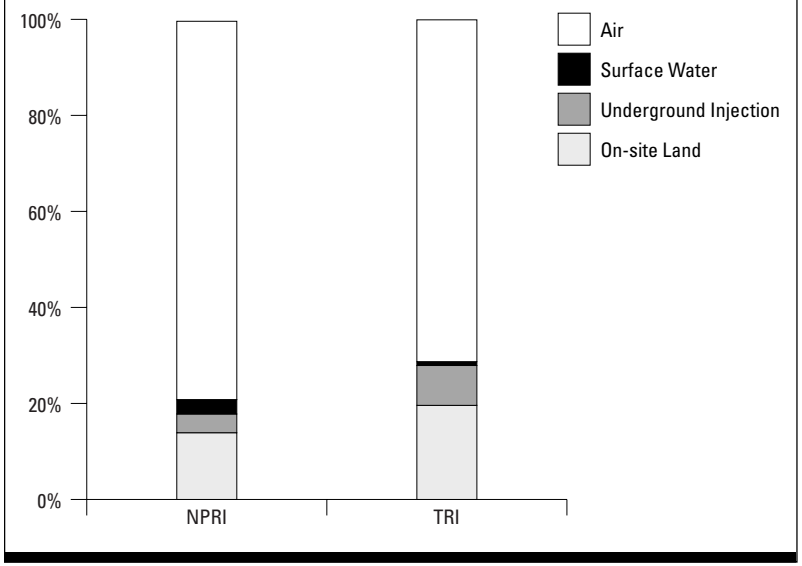
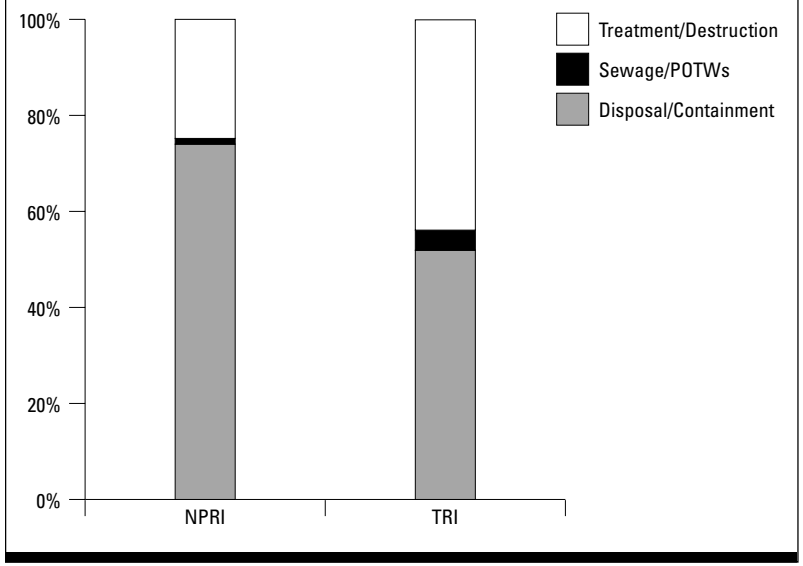


Figure 5–10
M 1996
NPRI and TRI Transfers of Known or Suspected Carcinogens†



† Carcinogenic substances are those chemicals or chemical compounds listed in either the International Agency for Research on Cancer (IARC) Monographs or the US National Toxicological Program (NTP) Annual Report on Carcinogens.

➤ A chemical (and its compounds) is included if the chemical or any of its compounds is designated carcinogenic.

Top Facilities for Releases and Transfers of Carcinogens

Releases. The top 50 NPRI facilities for total releases of substances designated as known or suspected carcinogens submitted 11 percent of the NPRI forms for carcinogens and reported 73 percent of the NPRI releases of these substances. In TRI, the top 50 facilities for total releases of designated carcinogens submitted one percent of the forms for such substances and reported 36 percent of the releases (**Figure 5–11** and **Tables 5–24**, pp. 140–41 and **5–25**, pp. 142–43).

The greatest difference appeared in the proportion of carcinogen releases to air and surface waters in the two countries. In NPRI, the top 50 facilities reported 69 percent of the air emissions and 78 percent of the surface water discharges of designated carcinogens. In TRI, the top 50 facilities accounted for approximately 16 percent of both types of carcinogen releases.

Releases and Transfers. Total releases and transfers of designated carcinogens were also highly concentrated among the NPRI and TRI facilities reporting the largest amounts. The top 50 NPRI facilities reported two-thirds of all NPRI releases and transfers of these substances. The top 50 TRI facilities reported nearly one-third of the TRI releases and transfers of the designated carcinogens (**Figure 5–12** and **Tables 5–26**, pp. 144–45 and **5–27**, pp. 146–47).

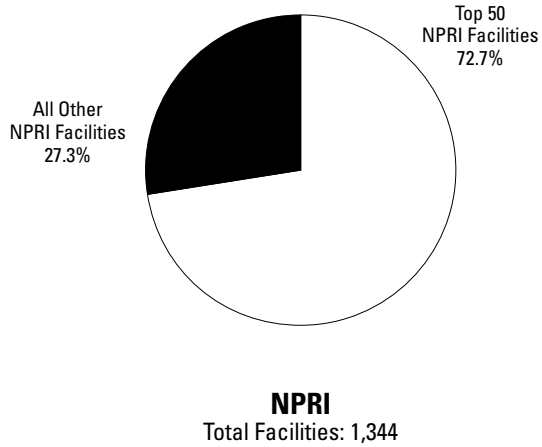
The top NPRI facilities reported more than half of the NPRI releases and transfers of these chemicals in all categories except transfers to sewage/POTWs, the smallest type of release or transfer for carcinogens. The top TRI facilities reported the majority of TRI releases of carcinogens in two release categories only (underground injection and on-site land releases).

Among these 50 NPRI facilities, 22 reported in the primary metals sector (US SIC code 33) and 8 in chemical manufacturing (US SIC code 28). In TRI, this order was reversed: 21 facilities reported in chemical manufacturing, while 14 reported in primary metals. Six facilities in both NPRI and TRI were rubber and plastics products manufacturers (US SIC code 30).

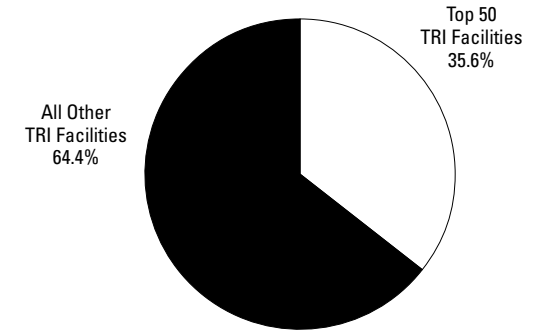
[Text continues on p. 148.]

Figure 5–11 M 1996

NPRI and TRI Total Releases of Known or Suspected Carcinogens,† Top 50 Facilities and All Others



NPRI
Total Facilities: 1,344



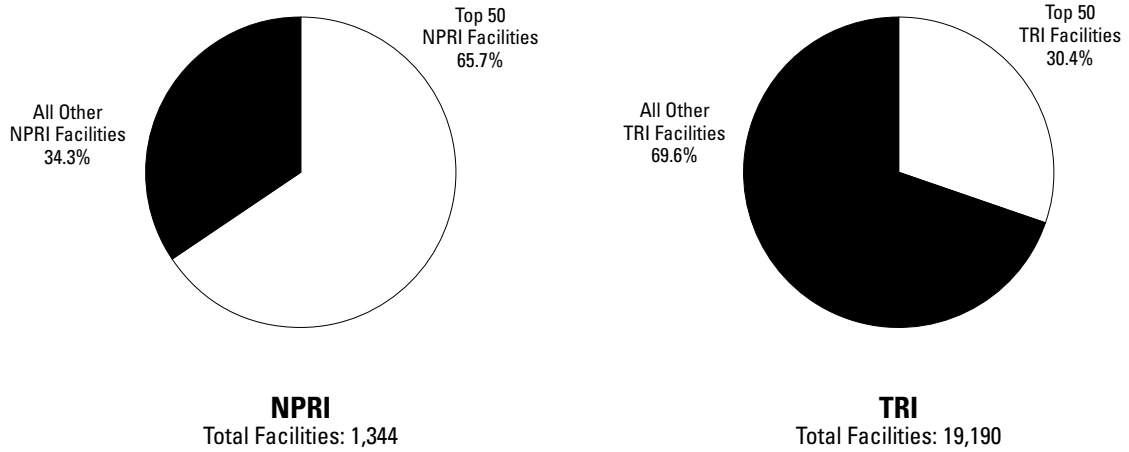
TRI
Total Facilities: 19,190

† Carcinogenic substances are those chemicals or chemical compounds listed in either the International Agency for Research on Cancer (IARC) Monographs or the US National Toxicological Program (NTP) Annual Report on Carcinogens.

➤ A chemical (and its compounds) is included if the chemical or any of its compounds is designated carcinogenic.

Figure 5–12
M 1996

NPRI and TRI Total Releases and Transfers of Known or Suspected Carcinogens,† Top 50 Facilities and All Others



† Carcinogenic substances are those chemicals or chemical compounds listed in either the International Agency for Research on Cancer (IARC) Monographs or the US National Toxicological Program (NTP) Annual Report on Carcinogens.

➤ A chemical (and its compounds) is included if the chemical or any of its compounds is designated carcinogenic.

Table 5–16

M 1996

Top 10 NPRI Chemicals for Release/Transfer Categories

CAS Number	Chemical	Total Air Emissions	Surface Water Discharges	Underground Injection	On-site Land Releases	Treatment/ Destruction	Sewage/ POTWs	Disposal/ Containment
67-56-1	Methanol	1	1	1	10	2	5	—
—	Zinc (and its compounds)	—	5	—	1	1	8	1
—	Manganese (and its compounds)	—	4	—	2	7	—	2
1330-20-7	Xylene (mixed isomers)	2	—	—	—	3	—	—
—	Nitric acid and nitrate compounds	—	2	3	—	—	1	—
108-88-3	Toluene	3	—	9	9	4	—	—
78-93-3	Methyl ethyl ketone	5	—	2	—	5	—	—
7664-93-9	Sulphuric acid	4	—	—	—	—	—	—
—	Lead (and its compounds)	—	—	—	3	—	—	3
110-82-7	Cyclohexane	6	—	—	—	—	—	—
—	Chromium (and its compounds)	—	10	—	5	6	—	4
75-09-2	Dichloromethane	8	—	—	—	—	—	—
74-85-1	Ethylene	7	—	—	—	—	—	—
71-43-2	Benzene	10	—	8	—	—	—	—
7664-39-3	Hydrogen fluoride	9	—	—	—	—	—	—
50-00-0	Formaldehyde	—	3	7	—	—	4	—
71-36-3	n-Butyl alcohol	—	—	—	—	9	9	—
—	Copper (and its compounds)	—	—	—	6	—	—	6
1332-21-4	Asbestos (friable form)	—	—	—	7	—	—	5
107-21-1	Ethylene glycol	—	6	—	—	8	3	—
108-95-2	Phenol (and its salts)	—	8	—	—	10	2	8
7782-50-5	Chlorine	—	9	—	—	—	—	—
—	Nickel (and its compounds)	—	7	—	8	—	7	9
7429-90-5	Aluminum (fume or dust)	—	—	—	4	—	—	10
7664-38-2	Phosphoric acid	—	—	—	—	—	6	7
75-07-0	Acetaldehyde	—	—	5	—	—	—	—
108-05-4	Vinyl acetate	—	—	4	—	—	—	—
75-65-0	tert-Butyl alcohol	—	—	6	—	—	—	—
111-42-2	Diethanolamine (and its salts)	—	—	10	—	—	—	—
—	Selenium (and its compounds)	—	—	—	—	—	10	—

➤ Chemicals listed in descending order of total releases and transfers.

Table 5–17
M 1996

Top 10 TRI Chemicals for Release/Transfer Categories

CAS Number	Chemical	Total Air Emissions	Surface Water Discharges	Underground Injection	On-site Land Releases	Treatment/ Destruction	Sewage/ POTWs	Disposal/ Containment
67-56-1	Methanol	1	3	2	—	2	1	—
—	Nitric acid and nitrate compounds	—	1	1	9	4	2	10
—	Zinc (and its compounds)	—	6	—	1	1	—	1
108-88-3	Toluene	2	—	—	—	3	—	—
—	Manganese (and its compounds)	—	4	—	3	8	—	2
1330-20-7	Xylene (mixed isomers)	3	—	—	—	7	—	—
—	Copper (and its compounds)	—	—	—	2	—	—	4
75-15-0	Carbon disulfide	4	—	—	—	—	—	—
7782-50-5	Chlorine	5	8	—	—	—	—	—
7664-38-2	Phosphoric acid	—	2	—	4	—	5	—
75-09-2	Dichloromethane	8	—	—	—	6	—	—
78-93-3	Methyl ethyl ketone	7	—	—	—	10	—	—
7647-01-0	Hydrochloric acid	6	—	—	—	—	—	—
—	Lead (and its compounds)	—	—	—	6	5	—	3
—	Chromium (and its compounds)	—	7	—	5	—	—	5
100-42-5	Styrene	9	—	—	—	—	—	—
107-21-1	Ethylene glycol	—	5	5	—	9	3	—
74-85-1	Ethylene	10	—	—	—	—	—	—
75-05-8	Acetonitrile	—	—	3	—	—	—	—
71-36-3	n-Butyl alcohol	—	—	10	—	—	7	—
50-00-0	Formaldehyde	—	10	4	—	—	6	—
108-95-2	Phenol	—	—	—	—	—	4	—
—	Nickel (and its compounds)	—	—	—	7	—	—	7
7429-90-5	Aluminum (fume or dust)	—	—	—	8	—	—	8
67-66-3	Chloroform	—	9	—	—	—	—	—
1344-28-1	Aluminum oxide (fibrous forms)	—	—	—	—	—	—	6
—	Antimony (and its compounds)	—	—	—	—	—	—	9
79-10-7	Acrylic acid	—	—	7	—	—	—	—
79-06-1	Acrylamide	—	—	6	—	—	—	—
107-13-1	Acrylonitrile	—	—	8	—	—	—	—
—	Cyanides	—	—	9	—	—	—	—
75-65-0	tert-Butyl alcohol	—	—	—	—	—	9	—
111-42-2	Diethanolamine	—	—	—	—	—	8	—
62-53-3	Aniline	—	—	—	—	—	10	—
7723-14-0	Phosphorus (yellow or white)	—	—	—	10	—	—	—

➤ Chemicals listed in descending order of total releases and transfers.

Table 5–18

M 1996

NPRI Releases of Known or Suspected Carcinogens†

CAS Number	Chemical	Total Air Emissions (kg)	Surface Water Discharges (kg)	Underground Injection (kg)	On-site Land Releases (kg)	Total Releases (kg)	% of Total for Carcinogens
75-09-2	Dichloromethane	2,195,732	0	0	49	2,198,402	19.9
71-43-2	Benzene	1,723,715	943	42,971	29,119	1,796,748	16.3
50-00-0	Formaldehyde	1,110,808	233,253	52,580	150	1,399,467	12.7
—	Lead (and its compounds)	560,640	6,124	45	820,693	1,393,051	12.6
100-42-5	Styrene	859,930	30	468	202	866,408	7.8
79-01-6	Trichloroethylene	836,512	46	0	0	837,692	7.6
—	Chromium (and its compounds)	16,565	16,896	200	454,030	493,593	4.5
75-07-0	Acetaldehyde	274,068	3,326	150,000	0	427,394	3.9
—	Nickel (and its compounds)	275,954	49,972	9	67,675	396,159	3.6
108-05-4	Vinyl acetate	131,364	0	190,000	100	322,740	2.9
67-66-3	Chloroform	201,253	6,908	0	0	208,161	1.9
1332-21-4	Asbestos (friable)	186	0	0	155,007	155,193	1.4
127-18-4	Tetrachloroethylene	130,906	80	0	74	131,990	1.2
—	Arsenic (and its compounds)	123,216	1,581	0	0	125,128	1.1
106-99-0	1,3-Butadiene	124,315	0	0	12	124,455	1.1
117-81-7	Di(2-ethylhexyl) phthalate	28,830	0	0	36	28,899	0.3
—	Cobalt (and its compounds)	10,197	1,840	0	13,309	25,646	0.2
75-21-8	Ethylene oxide	22,829	0	0	0	23,094	0.2
75-01-4	Vinyl chloride	20,043	140	0	0	20,408	0.2
—	Cadmium (and its compounds)	17,750	522	0	0	18,952	0.2
107-06-2	1,2-Dichloroethane	16,665	41	0	610	17,316	0.2
75-56-9	Propylene oxide	11,348	0	0	0	11,448	0.1
107-13-1	Acrylonitrile	10,390	0	0	0	10,775	0.1
106-46-7	1,4-Dichlorobenzene	9,100	0	0	0	9,200	0.1
123-91-1	1,4-Dioxane	954	5,100	0	0	6,054	0.1
79-06-1	Acrylamide	356	530	0	0	1,086	0.0
26471-62-5	Toluenediisocyanate (mixed isomers)	85	0	0	0	929	0.0
139-13-9	Nitrilotriacetic acid	25	0	0	0	646	0.0
96-09-3	Styrene oxide	0	0	0	0	537	0.0
56-23-5	Carbon tetrachloride	461	28	0	0	489	0.0
140-88-5	Ethyl acrylate	100	0	0	0	280	0.0
106-89-8	Epichlorohydrin	0	0	0	0	127	0.0
79-46-9	2-Nitropropane	0	0	0	0	125	0.0
77-78-1	Dimethyl sulfate	11	0	0	0	11	0.0
101-14-4	4,4'-Methylenebis(2-chloroaniline)	0	0	0	0	5	0.0
584-84-9	Toluene-2,4-diisocyanate	0	0	0	0	2	0.0
	Subtotal	**8,714,308**	**327,360**	**436,273**	**1,541,066**	**11,052,610**	**100.0**
	% of the Following Totals	**13.7**	**6.4**	**9.1**	**17.2**	**13.4**	
	Total for All Matched NPRI Chemicals	**63,590,706**	**5,128,134**	**4,812,379**	**8,936,491**	**82,596,460**	

† Carcinogenic substances are those chemicals or chemical compounds listed in either the International Agency for Research on Cancer (IARC) Monographs or the US National Toxicological Program (NTP) Annual Report on Carcinogens.

➤ A chemical (and its compounds) is included if the chemical or any of its compounds is designated carcinogenic.

Table 5–19

M 1996

TRI Releases of Known or Suspected Carcinogens†

CAS Number	Chemical	Total Air Emissions (kg)	Surface Water Discharges (kg)	Underground Injection (kg)	On-site Land Releases (kg)	Total Releases (kg)	% of Total for Carcinogens
75-09-2	Dichloromethane	23,853,107	4,558	339,912	2,121	24,199,698	21.0
100-42-5	Styrene	18,936,497	5,834	103,545	119,995	19,165,871	16.6
—	Chromium (and its compounds)	403,529	322,479	16,976	12,199,556	12,942,540	11.2
79-01-6	Trichloroethylene	9,625,277	245	585	8,227	9,634,334	8.4
50-00-0	Formaldehyde	5,145,781	145,126	4,264,524	51,885	9,607,316	8.3
—	Lead (and its compounds)	817,653	28,045	360	6,791,505	7,637,563	6.6
75-07-0	Acetaldehyde	5,703,399	90,016	212,545	7,619	6,013,579	5.2
67-66-3	Chloroform	4,227,400	154,375	20,584	14,834	4,417,193	3.8
71-43-2	Benzene	3,662,516	12,302	141,731	32,361	3,848,910	3.3
127-18-4	Tetrachloroethylene	3,487,435	481	6,093	13,806	3,507,815	3.0
79-06-1	Acrylamide	5,306	1,657	2,606,873	67,644	2,681,480	2.3
107-13-1	Acrylonitrile	587,504	268	1,630,493	137	2,218,402	1.9
—	Nickel (and its compounds)	318,459	39,922	41,044	1,795,732	2,195,157	1.9
108-05-4	Vinyl acetate	1,726,101	1,085	136,403	1,285	1,864,874	1.6
106-99-0	1,3-Butadiene	1,236,415	4,989	454	119	1,241,977	1.1
—	Arsenic (and its compounds)	70,258	2,026	27,791	838,905	938,980	0.8
107-06-2	1,2-Dichloroethane	473,729	838	2,325	11,451	488,343	0.4
75-01-4	Vinyl chloride	462,498	161	151	0	462,810	0.4
75-21-8	Ethylene oxide	318,181	2,029	10,068	250	330,528	0.3
75-56-9	Propylene oxide	263,429	20,586	5,506	152	289,673	0.3
—	Cadmium (and its compounds)	20,256	2,097	37	250,996	273,386	0.2
117-81-7	Di(2-ethylhexyl) phthalate	210,625	124	0	31,887	242,636	0.2
1332-21-4	Asbestos (friable)	1,252	1	0	217,487	218,740	0.2
—	Cobalt (and its compounds)	28,677	14,644	7,219	130,326	180,866	0.2
56-23-5	Carbon tetrachloride	159,116	98	20,188	0	179,402	0.2
106-89-8	Epichlorohydrin	150,124	9,404	0	1,000	160,528	0.1
123-91-1	1,4-Dioxane	54,402	102,947	0	2,453	159,802	0.1
106-46-7	1,4-Dichlorobenzene	107,257	853	907	218	109,235	0.1
140-88-5	Ethyl acrylate	84,552	90	0	234	84,876	0.1
101-77-9	4,4'-Methylenedianiline	4,427	10	18,649	0	23,086	0.0
26471-62-5	Toluenediisocyanate (mixed isomers)	20,550	0	0	160	20,710	0.0
79-46-9	2-Nitropropane	15,550	1,265	0	0	16,815	0.0
91-08-7	Toluene-2,6-diisocyanate	6,198	0	0	22	6,220	0.0
302-01-2	Hydrazine	4,509	10	0	113	4,632	0.0
584-84-9	Toluene-2,4-diisocyanate	3,295	0	0	87	3,382	0.0
62-56-6	Thiourea	550	154	2,268	113	3,085	0.0
77-78-1	Dimethyl sulfate	2,629	0	0	0	2,629	0.0
64-67-5	Diethyl sulfate	1,455	0	0	0	1,455	0.0
139-13-9	Nitrilotriacetic acid	5	35	680	0	720	0.0
95-80-7	2,4-Diaminotoluene	714	0	0	0	714	0.0
101-14-4	4,4'-Methylenebis(2-chloroaniline)	229	0	0	340	569	0.0
94-59-7	Safrole	229	0	0	0	229	0.0
96-45-7	Ethylene thiourea	122	0	0	0	122	0.0
96-09-3	Styrene oxide	14	0	0	0	14	0.0
	Subtotal	**82,201,211**	**968,754**	**9,617,911**	**22,593,021**	**115,380,897**	**100.0**
	% of the Following Totals	**16.5**	**1.3**	**13.7**	**16.5**	**14.8**	
	Total for All Matched TRI Chemicals	**499,678,471**	**73,614,363**	**70,427,564**	**136,901,554**	**780,621,952**	

† Carcinogenic substances are those chemicals or chemical compounds listed in either the International Agency for Research on Cancer (IARC) Monographs or the US National Toxicological Program (NTP) Annual Report on Carcinogens.

➤ A chemical (and its compounds) is included if the chemical or any of its compounds is designated carcinogenic.

Table 5–20

M 1996

NPRI Transfers of Known or Suspected Carcinogens†

CAS Number	Chemical	Treatment/ Destruction (kg)	Sewage/ POTW (kg)	Disposal/ Containment (kg)	Total Transfers (kg)	% of Total for Carcinogens
—	Lead (and its compounds)	196,217	2,376	2,057,027	2,255,620	32.7
—	Chromium (and its compounds)	575,785	7,318	1,670,586	2,253,689	32.6
1332-21-4	Asbestos (friable)	0	0	917,016	917,016	13.3
—	Nickel (and its compounds)	216,967	11,427	272,761	501,155	7.3
50-00-0	Formaldehyde	217,333	51,999	33,382	302,714	4.4
100-42-5	Styrene	192,604	237	62,264	255,105	3.7
75-09-2	Dichloromethane	85,222	4,800	300	90,322	1.3
71-43-2	Benzene	74,026	21	724	74,771	1.1
127-18-4	Tetrachloroethylene	65,852	0	869	66,721	1.0
—	Arsenic (and its compounds)	1,264	161	46,260	47,685	0.7
117-81-7	Di(2-ethylhexyl) phthalate	7,125	71	34,461	41,657	0.6
79-01-6	Trichloroethylene	24,993	0	0	24,993	0.4
107-13-1	Acrylonitrile	17,262	214	0	17,476	0.3
—	Cobalt (and its compounds)	2,370	10	8,477	10,857	0.2
26471-62-5	Toluenediisocyanate (mixed isomers)	8,012	0	20	8,032	0.1
56-23-5	Carbon tetrachloride	7,384	0	0	7,384	0.1
75-07-0	Acetaldehyde	6,630	0	10	6,640	0.1
108-05-4	Vinyl acetate	1,910	1,100	3,563	6,573	0.1
106-99-0	1,3-Butadiene	5,076	0	0	5,076	0.1
67-66-3	Chloroform	4,125	0	131	4,256	0.1
—	Cadmium (and its compounds)	0	8	2,775	2,783	0.0
139-13-9	Nitrilotriacetic acid	122	1,437	0	1,559	0.0
584-84-9	Toluene-2,4-diisocyanate	250	0	250	500	0.0
106-46-7	1,4-Dichlorobenzene	0	0	400	400	0.0
107-06-2	1,2-Dichloroethane	160	0	0	160	0.0
140-88-5	Ethyl acrylate	160	0	0	160	0.0
79-06-1	Acrylamide	0	59	78	137	0.0
75-01-4	Vinyl chloride	0	0	1	1	0.0
91-08-7	Toluene-2,6-diisocyanate	1	0	0	1	0.0
	Subtotal	**1,710,850**	**81,238**	**5,111,355**	**6,903,443**	**100.0**
	% of the Following Totals	**12.6**	**1.6**	**22.2**	**16.6**	
	Total for All Matched NPRI Chemicals	**13,571,799**	**4,943,234**	**23,017,654**	**41,532,687**	

† Carcinogenic substances are those chemicals or chemical compounds listed in either the International Agency for Research on Cancer (IARC) Monographs or the US National Toxicological Program (NTP) Annual Report on Carcinogens.

➤ A chemical (and its compounds) is included if the chemical or any of its compounds is designated carcinogenic.

Table 5–21

M 1996

TRI Transfers of Known or Suspected Carcinogens†

CAS Number	Chemical	Treatment/ Destruction (kg)	Sewage/ POTWs (kg)	Disposal/ Containment (kg)	Total Transfers (kg)	% of Total for Carcinogens
—	Lead (and its compounds)	6,383,793	21,542	10,841,028	17,246,363	31.1
—	Chromium (and its compounds)	1,791,866	134,465	7,562,568	9,488,899	17.1
75-09-2	Dichloromethane	5,344,261	290,380	868,408	6,503,049	11.7
—	Nickel (and its compounds)	1,326,369	81,408	3,723,600	5,131,377	9.2
100-42-5	Styrene	1,243,597	119,942	1,470,682	2,834,221	5.1
1332-21-4	Asbestos (friable)	34	341	1,503,906	1,504,281	2.7
—	Arsenic (and its compounds)	822,904	241	563,941	1,387,086	2.5
50-00-0	Formaldehyde	318,094	856,586	149,437	1,324,117	2.4
67-66-3	Chloroform	843,714	149,448	17,627	1,010,789	1.8
108-05-4	Vinyl acetate	883,212	65,708	12,274	961,194	1.7
117-81-7	Di(2-ethylhexyl) phthalate	102,279	9,562	799,475	911,316	1.6
71-43-2	Benzene	676,196	97,366	28,089	801,651	1.4
79-01-6	Trichloroethylene	719,158	39,180	34,615	792,953	1.4
56-23-5	Carbon tetrachloride	725,993	218	4,193	730,404	1.3
106-89-8	Epichlorohydrin	654,723	5,202	1,876	661,801	1.2
127-18-4	Tetrachloroethylene	545,401	838	7,860	554,099	1.0
—	Cadmium (and its compounds)	103,225	1,427	425,648	530,300	1.0
107-13-1	Acrylonitrile	459,800	39,973	3,011	502,784	0.9
107-06-2	1,2-Dichloroethane	420,065	2,888	41,383	464,336	0.8
—	Cobalt (and its compounds)	57,337	6,334	338,362	402,033	0.7
123-91-1	1,4-Dioxane	10,009	72,788	217,410	300,207	0.5
75-07-0	Acetaldehyde	141,381	157,233	1,117	299,731	0.5
26471-62-5	Toluenediisocyanate (mixed isomers)	249,600	0	15,115	264,715	0.5
106-46-7	1,4-Dichlorobenzene	230,887	36	0	230,923	0.4
79-06-1	Acrylamide	12,402	29,605	136,769	178,776	0.3
140-88-5	Ethyl acrylate	149,204	10,925	14,845	174,974	0.3
75-56-9	Propylene oxide	849	93,753	17,791	112,393	0.2
75-21-8	Ethylene oxide	437	53,164	475	54,076	0.1
106-99-0	1,3-Butadiene	41,732	304	2,172	44,208	0.1
75-01-4	Vinyl chloride	26,027	333	8,895	35,255	0.1
101-77-9	4,4'-Methylenedianiline	25,030	917	8,885	34,832	0.1
302-01-2	Hydrazine	887	1,693	8,412	10,992	0.0
139-13-9	Nitrilotriacetic acid	0	8,163	0	8,163	0.0
584-84-9	Toluene-2,4-diisocyanate	5,755	0	1,626	7,381	0.0
62-56-6	Thiourea	5,022	115	1,175	6,312	0.0
79-46-9	2-Nitropropane	5,654	0	0	5,654	0.0
91-08-7	Toluene-2,6-diisocyanate	5,057	0	407	5,464	0.0
101-14-4	4,4'-Methylenebis(2-chloroaniline)	5,124	2	2	5,128	0.0
96-45-7	Ethylene thiourea	1,277	0	1,846	3,123	0.0
64-67-5	Diethyl sulfate	685	1,945	21	2,651	0.0
95-80-7	2,4-Diaminotoluene	127	0	0	127	0.0
94-59-7	Safrole	0	61	0	61	0.0
77-78-1	Dimethyl sulfate	0	2	0	2	0.0
	Subtotal	**24,339,167**	**2,354,088**	**28,834,946**	**55,528,201**	**100.0**
	% of the Following Totals	**21.9**	**2.7**	**23.2**	**17.3**	
	Total for All Matched TRI Chemicals	**110,901,271**	**86,130,663**	**124,047,657**	**321,079,591**	

† Carcinogenic substances are those chemicals or chemical compounds listed in either the International Agency for Research on Cancer (IARC) Monographs or the US National Toxicological Program (NTP) Annual Report on Carcinogens.

➤ A chemical (and its compounds) is included if the chemical or any of its compounds is designated carcinogenic.

Table 5–22

M 1996

NPRI Releases and Transfers of Known or Suspected Carcinogens†

CAS Number	Chemical	Forms		Total Releases (kg)	Total Transfers (kg)	Total Releases and Transfers (kg)	% of Total for Carcinogens
		Number	%				
—	Lead (and its compounds)	130	12.0	1,393,051	2,255,620	3,648,671	20.3
—	Chromium (and its compounds)	213	19.6	493,593	2,253,689	2,747,282	15.3
75-09-2	Dichloromethane	50	4.6	2,198,402	90,322	2,288,724	12.7
71-43-2	Benzene	43	4.0	1,796,748	74,771	1,871,519	10.4
50-00-0	Formaldehyde	84	7.7	1,399,467	302,714	1,702,181	9.5
100-42-5	Styrene	73	6.7	866,408	255,105	1,121,513	6.2
1332-21-4	Asbestos (friable)	32	2.9	155,193	917,016	1,072,209	6.0
—	Nickel (and its compounds)	137	12.6	396,159	501,155	897,314	5.0
79-01-6	Trichloroethylene	36	3.3	837,692	24,993	862,685	4.8
75-07-0	Acetaldehyde	15	1.4	427,394	6,640	434,034	2.4
108-05-4	Vinyl acetate	10	0.9	322,740	6,573	329,313	1.8
67-66-3	Chloroform	11	1.0	208,161	4,256	212,417	1.2
127-18-4	Tetrachloroethylene	25	2.3	131,990	66,721	198,711	1.1
—	Arsenic (and its compounds)	33	3.0	125,128	47,685	172,813	1.0
106-99-0	1,3-Butadiene	10	0.9	124,455	5,076	129,531	0.7
117-81-7	Di(2-ethylhexyl) phthalate	30	2.8	28,899	41,657	70,556	0.4
—	Cobalt (and its compounds)	23	2.1	25,646	10,857	36,503	0.2
107-13-1	Acrylonitrile	9	0.8	10,775	17,476	28,251	0.2
75-21-8	Ethylene oxide	10	0.9	23,094	0	23,094	0.1
—	Cadmium (and its compounds)	11	1.0	18,952	2,783	21,735	0.1
75-01-4	Vinyl chloride	8	0.7	20,408	1	20,409	0.1
107-06-2	1,2-Dichloroethane	4	0.4	17,316	160	17,476	0.1
75-56-9	Propylene oxide	4	0.4	11,448	0	11,448	0.1
106-46-7	1,4-Dichlorobenzene	4	0.4	9,200	400	9,600	0.1
26471-62-5	Toluenediisocyanate (mixed isomers)	29	2.7	929	8,032	8,961	0.0
56-23-5	Carbon tetrachloride	4	0.4	489	7,384	7,873	0.0
123-91-1	1,4-Dioxane	2	0.2	6,054	0	6,054	0.0
139-13-9	Nitrilotriacetic acid	15	1.4	646	1,559	2,205	0.0
79-06-1	Acrylamide	6	0.6	1,086	137	1,223	0.0
96-09-3	Styrene oxide	4	0.4	537	0	537	0.0
584-84-9	Toluene-2,4-diisocyanate	3	0.3	2	500	502	0.0
140-88-5	Ethyl acrylate	7	0.6	280	160	440	0.0
106-89-8	Epichlorohydrin	2	0.2	127	0	127	0.0
79-46-9	2-Nitropropane	1	0.1	125	0	125	0.0
77-78-1	Dimethyl sulfate	1	0.1	11	0	11	0.0
101-14-4	4,4'-Methylenebis(2-chloroaniline)	1	0.1	5	0	5	0.0
91-08-7	Toluene-2,6-diisocyanate	1	0.1	0	1	1	0.0
302-01-2	Hydrazine	2	0.2	0	0	0	0.0
101-77-9	4,4'-Methylenedianiline	1	0.1	0	0	0	0.0
62-56-6	Thiourea	1	0.1	0	0	0	0.0
	Subtotal	**1,085**	**100.0**	**11,052,610**	**6,903,443**	**17,956,053**	**100.0**
	% of the Following Totals	**25.2**		**13.4**	**16.6**	**14.5**	
	Total for All Matched NPRI Chemicals	**4,298**		**82,596,460**	**41,532,687**	**124,129,147**	

† Carcinogenic substances are those chemicals or chemical compounds listed in either the International Agency for Research on Cancer (IARC) Monographs or the US National Toxicological Program (NTP) Annual Report on Carcinogens.

➤ A chemical (and its compounds) is included if the chemical or any of its compounds is designated carcinogenic.

Table 5–23

M 1996

TRI Releases and Transfers of Known or Suspected Carcinogens†

CAS Number	Chemical	Forms		Total Releases (kg)	Total Transfers (kg)	Total Releases and Transfers (kg)	% of Total for Carcinogens
		Number	%				
75-09-2	Dichloromethane	888	5.7	24,199,698	6,503,049	30,702,747	18.0
—	Lead (and its compounds)	1,640	10.5	7,637,563	17,246,363	24,883,926	14.6
—	Chromium (and its compounds)	3,154	20.1	12,942,540	9,488,899	22,431,439	13.1
100-42-5	Styrene	1,465	9.3	19,165,871	2,834,221	22,000,092	12.9
50-00-0	Formaldehyde	765	4.9	9,607,316	1,324,117	10,931,433	6.4
79-01-6	Trichloroethylene	657	4.2	9,634,334	792,953	10,427,287	6.1
—	Nickel (and its compounds)	2,760	17.6	2,195,157	5,131,377	7,326,534	4.3
75-07-0	Acetaldehyde	247	1.6	6,013,579	299,731	6,313,310	3.7
67-66-3	Chloroform	156	1.0	4,417,193	1,010,789	5,427,982	3.2
71-43-2	Benzene	453	2.9	3,848,910	801,651	4,650,561	2.7
127-18-4	Tetrachloroethylene	381	2.4	3,507,815	554,099	4,061,914	2.4
79-06-1	Acrylamide	72	0.5	2,681,480	178,776	2,860,256	1.7
108-05-4	Vinyl acetate	178	1.1	1,864,874	961,194	2,826,068	1.7
107-13-1	Acrylonitrile	108	0.7	2,218,402	502,784	2,721,186	1.6
—	Arsenic (and its compounds)	392	2.5	938,980	1,387,086	2,326,066	1.4
1332-21-4	Asbestos (friable)	72	0.5	218,740	1,504,281	1,723,021	1.0
106-99-0	1,3-Butadiene	185	1.2	1,241,977	44,208	1,286,185	0.8
117-81-7	Di(2-ethylhexyl) phthalate	307	2.0	242,636	911,316	1,153,952	0.7
107-06-2	1,2-Dichloroethane	79	0.5	488,343	464,336	952,679	0.6
56-23-5	Carbon tetrachloride	64	0.4	179,402	730,404	909,806	0.5
106-89-8	Epichlorohydrin	69	0.4	160,528	661,801	822,329	0.5
—	Cadmium (and its compounds)	143	0.9	273,386	530,300	803,686	0.5
—	Cobalt (and its compounds)	480	3.1	180,866	402,033	582,899	0.3
75-01-4	Vinyl chloride	47	0.3	462,810	35,255	498,065	0.3
123-91-1	1,4-Dioxane	46	0.3	159,802	300,207	460,009	0.3
75-56-9	Propylene oxide	118	0.8	289,673	112,393	402,066	0.2
75-21-8	Ethylene oxide	151	1.0	330,528	54,076	384,604	0.2
106-46-7	1,4-Dichlorobenzene	25	0.2	109,235	230,923	340,158	0.2
26471-62-5	Toluenediisocyanate (mixed isomers)	182	1.2	20,710	264,715	285,425	0.2
140-88-5	Ethyl acrylate	94	0.6	84,876	174,974	259,850	0.2
101-77-9	4,4'-Methylenedianiline	22	0.1	23,086	34,832	57,918	0.0
79-46-9	2-Nitropropane	4	0.0	16,815	5,654	22,469	0.0
302-01-2	Hydrazine	43	0.3	4,632	10,992	15,624	0.0
91-08-7	Toluene-2,6-diisocyanate	33	0.2	6,220	5,464	11,684	0.0
584-84-9	Toluene-2,4-diisocyanate	60	0.4	3,382	7,381	10,763	0.0
62-56-6	Thiourea	24	0.2	3,085	6,312	9,397	0.0
139-13-9	Nitrilotriacetic acid	8	0.1	720	8,163	8,883	0.0
101-14-4	4,4'-Methylenebis(2-chloroaniline)	23	0.1	569	5,128	5,697	0.0
64-67-5	Diethyl sulfate	32	0.2	1,455	2,651	4,106	0.0
96-45-7	Ethylene thiourea	10	0.1	122	3,123	3,245	0.0
77-78-1	Dimethyl sulfate	34	0.2	2,629	2	2,631	0.0
95-80-7	2,4-Diaminotoluene	1	0.0	714	127	841	0.0
94-59-7	Safrole	2	0.0	229	61	290	0.0
96-09-3	Styrene oxide	5	0.0	14	0	14	0.0
	Subtotal	**15,679**	**100.0**	**115,380,897**	**55,528,201**	**170,909,098**	**100.0**
	% of the Following Totals	**27.1**		**14.8**	**17.3**	**15.5**	
	Total for All Matched TRI Chemicals	**57,927**		**780,621,952**	**321,079,591**	**1,101,701,543**	

† Carcinogenic substances are those chemicals or chemical compounds listed in either the International Agency for Research on Cancer (IARC) Monographs or the US National Toxicological Program (NTP) Annual Report on Carcinogens.

➤ A chemical (and its compounds) is included if the chemical or any of its compounds is designated carcinogenic.

Table 5–24

M 1996

The 50 NPRI Facilities with the Largest Total Releases of Known or Suspected Carcinogens†

Rank	Facility	City, Province	SIC Codes Canada	SIC Codes US	Number of Forms	Total Air Emissions (kg)	Surface Water Discharges (kg)	Underground Injection (kg)	On-site Land Releases (kg)
1	Celanese Canada Inc.	Edmonton, AB	37	28	5	184,472	0	386,300	0
2	Dofasco Inc.	Hamilton, ON	29	33	5	456,937	542	0	51
3	Métallurgie Noranda Inc., Fonderie Horne	Rouyn-Noranda, QC	29	33	5	389,700	4,000	0	0
4	Novopharm Limited	Scarborough, ON	37	28	1	366,565	0	0	0
5	Fonderies canadiennes d'acier Ltée	Montréal, QC	31	35	2	100	0	0	251,500
6	Sandvik Steel Canada	Arnprior, ON	29	33	1	246,420	0	0	0
7	Carpenter Canada Limited	Woodbridge, ON	16	30	2	238,850	0	0	0
8	Stelco Inc., Hilton Works	Hamilton, ON	29	33	6	228,340	4,975	0	0
9	Co-Steel Lasco	Whitby, ON	29	33	3	1,408	53	0	231,800
10	Domfoam International Inc.	St-Léonard, QC	16	30	2	230,760	0	0	0
11	Sidbec-Dosco (Ispat) Inc., acierie	Contrecoeur, QC	29	33	2	4,540	0	0	226,000
12	Abitibi-Consolidated Inc., Division Port-Alfred	La Baie, QC	27	26	1	900	228,100	0	0
13	Valle Foam Industries Inc., Valle 1	Brampton, ON	16	30	2	218,660	0	0	0
14	Gerdau MRM Steel Inc.	Selkirk, MB	29	33	1	2,640	0	0	214,800
15	Inco Limited, Copper Cliff Smelter Complex	Copper Cliff, ON	29	33	4	215,858	0	0	0
16	Dow Chemical Canada Inc.	Sarnia, ON	37	28	8	66,012	2	0	148,007
17	Vitafoam Products Canada Ltd., Toronto Facility	Downsview, ON	16	30	3	209,597	0	0	0
18	Hudson Bay Mining and Smelting Co. Ltd., Metallurgical Complex	Flin Flon, MB	29	33	3	165,930	714	0	0
19	Algoma Steel Inc., Main Works	Sault Ste. Marie, ON	29	33	4	164,237	40	0	100
20	Bayer Rubber Inc.	Sarnia, ON	37	28	5	162,340	60	0	0
21	René Matériaux Composites Ltée	St-Éphrem-de-Beauce, QC	32	37	2	144,000	0	0	0
22	Sidbec-Dosco (Ispat) Inc., Sidbec-Feruni (Ispat)	Contrecoeur, QC	29	33	3	0	0	0	142,420
23	Weyerhaeuser Canada Ltd., Drayton Valley OSB Mill	Drayton Valley, AB	25	24	2	138,930	0	0	0
24	Foamex Canada Inc.	Toronto, ON	16	30	2	137,895	0	0	0
25	Wolverine Tube (Canada) Inc.	London, ON	29	33	1	133,212	0	0	0
26	Weyerhaeuser Canada Ltd., Edson OSB Mill	Edson, AB	25	24	2	114,740	0	0	0
27	Sammi Atlas Inc., Atlas Specialty Steels	Welland, ON	29	33	2	165	796	0	113,596
28	Mirolin Industries	Toronto, ON	16	30	2	104,980	0	0	0
29	Domtar Papers, Cornwall Business Unit	Cornwall, ON	27	26	1	104,409	2	0	0
30	Valle Foam Industries Inc., Valle 2	Brampton, ON	16	30	2	102,000	0	0	0
31	Inco Limited, Manitoba Division	Thompson, MB	29	33	3	79,129	13,715	0	0
32	Carpenter Canada Ltd.	Calgary, AB	16	30	2	92,700	0	0	0
33	Daishowa Marubeni International, Peace River Div.	Peace River, AB	27	26	1	90,000	2,420	0	0
34	Advanced Monobloc Manufacturing	Penetanguishene, ON	30	34	1	87,240	0	0	0
35	Weyerhaeuser Canada Ltd., Slave Lake OSB Mill	Slave Lake, AB	25	24	2	85,930	0	0	0
36	AT Plastics Inc.	Edmonton, AB	37	28	1	85,914	0	0	0
37	Nova Chemicals (Canada) Ltd.	Corunna, ON	36	29	3	84,763	0	0	35
38	Bombardier Inc., Division Jet Boat	St-Antoine-de-Tilly, QC	16	30	1	82,000	0	0	0
39	Grant Forest Products Corp.	Englehart, ON	25	24	1	81,800	0	0	0
40	Shell Canada Products Ltd., Sarnia Manufacturing Centre	Corunna, ON	36	29	4	78,193	55	0	145
41	AltaSteel Ltd.	Edmonton, AB	29	33	3	1,530	5	0	76,147
42	Blount Canada Ltd.	Guelph, ON	30	34	3	74,616	0	0	0
43	Uniboard Canada Inc.	Mont-Laurier, QC	25	24	1	71,386	0	0	0
44	Camoplast Inc., Div. Roski I	Roxton Falls, QC	32	37	1	69,000	0	0	0
45	Vitafoam Products Canada Ltd.	Calgary, AB	16	30	3	68,753	0	0	0
46	Imperial Oil, Sarnia Chemical Plant	Sarnia, ON	37	28	5	66,541	157	0	0
47	Uniboard Canada Inc.	Val-d'Or, QC	25	24	1	64,800	0	0	0
48	Petro-Canada, raffinerie de Montréal	Montréal, QC	36	29	2	63,600	249	0	0
49	Novopharm Limited	Markham, ON	37	28	1	61,955	0	0	0
50	Suzorite Mica Products Inc., Mica Plant	Boucherville, QC	35	32	1	60,000	0	0	0
	Subtotal				**124**	**5,984,447**	**255,885**	**386,300**	**1,404,601**
	% of the Following Totals				**11.4**	**68.7**	**78.2**	**88.5**	**91.1**
	Total for All Matched NPRI Carcinogens				**1,085**	**8,714,308**	**327,360**	**436,273**	**1,541,066**

† Carcinogenic substances are those chemicals or chemical compounds listed in either the International Agency for Research on Cancer (IARC) Monographs or the US National Toxicological Program (NTP) Annual Report on Carcinogens. A chemical (and its compounds) is included if the chemical or any of its compounds is designated carcinogenic.

* Chemicals accounting for more than 70% of total releases of carcinogens from the facility.

➤ UIJ=underground injection

Rank	Total Releases (kg)	Major Chemicals Reported (Primary Media)*
1	570,772	Acetaldehyde (UIJ, air), Vinyl acetate (UIJ)
2	457,530	Benzene (air)
3	393,700	Lead and compounds (air)
4	366,565	Dichloromethane (air)
5	251,600	Chromium and compounds (land)
6	246,420	Trichloroethylene (air)
7	238,953	Dichloromethane (air)
8	234,615	Benzene (air)
9	233,261	Lead and compounds (land)
10	230,802	Dichloromethane (air)
11	230,540	Lead and compounds (land)
12	229,000	Formaldehyde (water)
13	218,707	Dichloromethane (air)
14	217,440	Lead and compounds (land)
15	215,858	Nickel/Lead and compounds (air)
16	214,262	Asbestos (land), Benzene (air)
17	209,711	Dichloromethane (air)
18	166,644	Lead and compounds (air)
19	165,277	Benzene (air)
20	162,400	1,3-Butadiene, Benzene (air)
21	144,000	Styrene, Dichloromethane (air)
22	142,420	Lead and compounds (land)
23	138,930	Formaldehyde (air)
24	137,960	Dichloromethane (air)
25	133,212	Trichloroethylene (air)
26	114,740	Formaldehyde (air)
27	114,557	Chromium and compounds (land)
28	104,980	Dichloromethane, Styrene (air)
29	104,411	Benzene (air)
30	102,021	Dichloromethane (air)
31	92,844	Nickel and compounds (air)
32	92,783	Dichloromethane (air)
33	92,420	Chloroform (air)
34	87,240	Tetrachloroethylene (air)
35	85,930	Formaldehyde (air)
36	85,914	Vinyl acetate (air)
37	84,798	Benzene (air)
38	82,000	Styrene (air)
39	81,800	Formaldehyde (air)
40	78,614	Benzene (air)
41	77,682	Lead and compounds (land)
42	74,616	Trichloroethylene (air)
43	71,386	Formaldehyde (air)
44	69,000	Styrene (air)
45	68,753	Dichloromethane (air)
46	66,737	Benzene (air)
47	64,800	Formaldehyde (air)
48	63,938	Benzene (air)
49	61,955	Dichloromethane (air)
50	60,000	Dichloromethane (air)
	8,034,498	
	72.7	
	11,052,610	

Table 5–25

M 1996

The 50 TRI Facilities with the Largest Total Releases of Known or Suspected Carcinogens†

Rank	Facility	City, State	SIC Code	Number of Forms	Total Air Emissions (kg)	Surface Water Discharges (kg)	Underground Injection (kg)	On-site Land Releases (kg)
1	American Chrome & Chemicals, Harrisons & Crossfield	Corpus Christi, TX	28	1	2,063	113	0	5,124,717
2	Occidental Chemical Corp., Occidental Petroleum Corp.	Castle Hayne, NC	28	1	2,967	15	0	4,081,769
3	Monsanto Co.	Luling, LA	28	2	8,753	0	2,540,363	0
4	ASARCO Inc.	East Helena, MT	33	4	29,062	596	0	1,866,876
5	ASARCO Inc., Glover Plant	Annapolis, MO	33	4	150,576	14	0	1,295,185
6	Angus Chemical Co.	Sterlington, LA	28	4	13,698	2,040	1,361,431	0
7	Cyprus Miami Mining, Cyprus Amax Minerals Co.	Claypool, AZ	33	7	13,197	0	0	1,294,240
8	BP Chemicals Inc. Green Lake, BP America Inc.	Port Lavaca, TX	28	5	21,386	0	1,222,494	3
9	BP Chemicals Inc.	Lima, OH	28	10	43,701	0	1,151,760	0
10	Eastman Kodak Co., Kodak Park	Rochester, NY	38	9	1,119,503	22,802	0	39
11	Aquaglass Corp., Masco Corp.	Adamsville, TN	30	1	1,046,797	0	0	0
12	ASARCO Inc., Ray Complex/Hayden Smelter	Hayden, AZ	33	4	95,508	0	0	929,049
13	Cytec Industries Inc.	Westwego, LA	28	5	8,040	592	987,664	0
14	Glenbrook Nickel Co., Cominco American Inc.	Riddle, OR	33	1	17,061	7	0	905,522
15	Foamex L.P., Div. of Kihi	Corry, PA	30	2	756,420	0	0	0
16	Kennecott Utah Copper, Kennecott Holdings Corp.	Magna, UT	33	5	9,776	454	0	731,642
17	Carpenter Co., Tupelo Div.	Verona, MS	30	2	689,399	0	0	0
18	Doe Run Co., Herculaneum Smelter, Renco Group Inc.	Herculaneum, MO	33	6	92,688	75	0	596,449
19	Monsanto Co., Chocolate Bayou	Alvin, TX	28	3	12,307	0	645,125	0
20	FMC Corp.	Pocatello, ID	28	4	1,410	0	0	617,211
21	Abbott Chemicals Inc.	Barceloneta, PR	Mult.	1	585,261	0	0	0
22	GE Plastics Co., General Electric Co.	Mount Vernon, IN	28	6	569,148	259	0	0
23	Northwestern Steel & Wire Co.	Sterling, IL	33	3	4,998	299	0	528,345
24	Elkem Metals Co.	Marietta, OH	33	4	14,521	5,896	0	441,723
25	General Electric Co.	Ottawa, IL	28	4	460,365	39	0	0
26	Sterling Chemicals Inc.	Texas City, TX	28	10	69,611	0	387,913	0
27	Foamex International Inc.	Milan, TN	30	1	457,282	0	0	0
28	Upjohn Mfg. Co., Pharmacia & Upjohn Inc.	Arecibo, PR	28	2	455,125	0	0	0
29	Dow Chemical Co.	Freeport, TX	28	21	349,937	47,669	0	46,408
30	Nu-Foam Products, Ohio Decorative Products Inc.	Chattanooga, TN	30	2	420,896	0	0	0
31	Weyerhaeuser Co.	Longview, WA	Mult.	6	340,485	62,013	0	0
32	Aqua Glass West Inc., Masco Corp.	Klamath Falls, OR	30	1	395,697	0	0	0
33	Celanese Eng. Resins Inc., Hoechst Corp.	Bishop, TX	28	5	152,853	3,980	228,580	113
34	General Foam Corp., PMC Inc.	West Hazelton, PA	30	3	376,544	0	0	0
35	Carpenter Co.	Russellville, KY	Mult.	3	374,128	0	0	0
36	Tomkins Ind. Inc., Lasco Bathware Div.	Three Rivers, MI	30	1	362,998	0	0	0
37	General Electric Co.	Burkville, AL	28	2	358,731	1	0	0
38	Olympic Products Co., Cone Mills Corp.	Tupelo, MS	30	3	352,259	0	0	0
39	Boeing Co.	Wichita, KS	Mult.	6	350,141	231	0	0
40	Flexible Foam Products, Ohio Decorative Products	Elkhart, IN	30	2	339,873	0	0	0
41	Kimberly-Clark Corp.	Mobile, AL	26	2	320,181	12,698	0	0
42	General Foam Corp., PMC Inc.	Bridgeview, IL	30	3	322,330	0	0	0
43	Foamex L.P.	Morristown, TN	30	2	319,771	0	0	0
44	Tomkins Ind. Inc., Lasco Bathware Div.	Cordele, GA	30	1	309,375	0	0	0
45	Great Lakes Chemical Corp., Central Plant	El Dorado, AR	28	2	11,460	0	287,599	0
46	American Steel Foundries, Amsted Industries Inc.	Granite City, IL	33	2	3,302	0	0	293,424
47	Carpenter Co.	Elkhart, IN	30	3	293,377	0	0	0
48	Cleveland Laminating Corp.	Cleveland, OH	26	1	292,063	0	0	0
49	Federal Paper Board Co. Inc.	Riegelwood, NC	26	3	289,342	544	0	0
50	Metal Impact Corp.	Rosemont, IL	34	1	288,203	0	0	0
	Subtotal			**186**	**13,374,566**	**160,337**	**8,812,930**	**18,752,716**
	% of the Following Totals			**1.2**	**16.3**	**16.6**	**91.6**	**83.0**
	Total for All Matched TRI Carcinogens			**15,679**	**82,201,211**	**968,754**	**9,617,911**	**22,593,021**

† Carcinogenic substances are those chemicals or chemical compounds listed in either the International Agency for Research on Cancer (IARC) Monographs or the US National Toxicological Program (NTP) Annual Report on Carcinogens. A chemical (and its compounds) is included if the chemical or any of its compounds is designated carcinogenic.

* Chemicals accounting for more than 70% of total releases of carcinogens from the facility.

➤ UIJ=underground injection

Rank	Total Releases (kg)	Major Chemicals Reported (Primary Media)*
1	5,126,893	Chromium and compounds (land)
2	4,084,751	Chromium and compounds (land)
3	2,549,116	Formaldehyde (UIJ)
4	1,896,534	Lead and compounds (land)
5	1,445,775	Lead and compounds (land)
6	1,377,169	Formaldehyde (UIJ)
7	1,307,438	Lead/Chromium and compounds (land)
8	1,243,883	Acrylamide, Acrylonitrile (UIJ)
9	1,195,460	Acrylamide, Acrylonitrile (UIJ)
10	1,142,344	Dichloromethane (air)
11	1,046,797	Styrene (air)
12	1,024,557	Lead and compounds (land)
13	996,296	Acrylamide (UIJ)
14	922,590	Nickel and compounds (land)
15	756,420	Dichloromethane (air)
16	741,871	Lead/Arsenic and compounds (land)
17	689,399	Dichloromethane (air)
18	689,212	Lead and compounds (land)
19	657,431	Acrylonitrile (UIJ)
20	618,621	Chromium/Cadmium and compounds (land)
21	585,261	Dichloromethane (air)
22	569,407	Dichloromethane (air)
23	533,642	Lead/Chromium and compounds (land)
24	462,140	Chromium and compounds (land)
25	460,404	Styrene, Acrylonitrile (air)
26	457,524	Acrylamide (UIJ)
27	457,282	Dichloromethane (air)
28	455,125	Dichloromethane (air)
29	444,015	Epichlorohydrin, 1,2-Dichloroethane, Dichloromethane, Benzene, Propylene oxide, 1,3-Butadiene (air)
30	420,896	Dichloromethane (air)
31	402,498	Acetaldehyde, Chloroform (air)
32	395,697	Styrene (air)
33	385,526	Formaldehyde (UIJ, air)
34	376,544	Dichloromethane (air)
35	374,128	Dichloromethane (air)
36	362,998	Styrene (air)
37	358,732	Dichloromethane (air)
38	352,259	Dichloromethane (air)
39	350,372	Tetrachloroethylene (air)
40	339,873	Dichloromethane (air)
41	332,880	Chloroform (air)
42	322,330	Dichloromethane (air)
43	319,771	Dichloromethane (air)
44	309,375	Styrene (air)
45	299,059	Dichloromethane (UIJ)
46	296,726	Chromium and compounds (land)
47	293,377	Dichloromethane (air)
48	292,063	Dichloromethane (air)
49	289,887	Chloroform (air)
50	288,203	Tetrachloroethylene (air)
	41,100,549	
	35.6	
	115,380,897	

Table 5–26
M 1996

Top 50 NPRI Facilities with Largest Total Releases and Transfers of Known or Suspected Carcinogens†

Rank	Facility	City, Province	SIC Codes Canada	SIC Codes US	Number of Forms	Total Air Emissions (kg)	Surface Water Discharges (kg)	Underground Injection (kg)	On-site Land Releases (kg)
1	Dominion Castings Ltd.	Hamilton, ON	29	33	2	6,291	100	0	0
2	Co-Steel Lasco	Whitby, ON	29	33	3	1,408	53	0	231,800
3	Celanese Canada Inc.	Edmonton, AB	37	28	5	184,472	0	386,300	0
4	Dofasco Inc.	Hamilton, ON	29	33	5	456,937	542	0	51
5	Stelco Inc., Hilton Works	Hamilton, ON	29	33	6	228,340	4,975	0	0
6	Métallurgie Noranda Inc., Fonderie Horne	Rouyn-Noranda, QC	29	33	5	389,700	4,000	0	0
7	Tonolli Canada Limited	Mississauga, ON	29	33	1	2,307	50	0	0
8	Sammi Atlas Inc., Aciers inoxydables Atlas	Tracy, QC	29	33	3	22,840	350	0	0
9	Novopharm Limited	Scarborough, ON	37	28	1	366,565	0	0	0
10	Sammi Atlas Inc., Atlas Specialty Steels	Welland, ON	29	33	2	165	796	0	113,596
11	Dow Chemical Canada Inc.	Sarnia, ON	37	28	8	66,012	2	0	148,007
12	Slater Steels, Hamilton Specialty Bar Division	Hamilton, ON	29	33	5	1,959	0	0	100
13	Bayer Rubber Inc.	Sarnia, ON	37	28	5	162,340	60	0	0
14	Fonderies canadiennes d'acier Ltée	Montréal, QC	31	35	2	100	0	0	251,500
15	Sandvik Steel Canada	Arnprior, ON	29	33	1	246,420	0	0	0
16	Carpenter Canada Limited	Woodbridge, ON	16	30	2	238,850	0	0	0
17	Domfoam International Inc.	St-Léonard, QC	16	30	2	230,760	0	0	0
18	Sidbec-Dosco (Ispat) Inc., acierie	Contrecoeur, QC	29	33	2	4,540	0	0	226,000
19	Abitibi-Consolidated Inc., Division Port-Alfred	La Baie, QC	27	26	1	900	228,100	0	0
20	Dominion Colour Corporation	Ajax, ON	37	28	2	0	0	0	0
21	Metalex Products Ltd.	Richmond, BC	29	33	2	78	0	0	10,360
22	Valle Foam Industries Inc., Valle 1	Brampton, ON	16	30	2	218,660	0	0	0
23	Gerdau MRM Steel Inc.	Selkirk, MB	29	33	1	2,640	0	0	214,800
24	Inco Limited, Copper Cliff Smelter Complex	Copper Cliff, ON	29	33	4	215,858	0	0	0
25	Vitafoam Products Canada Ltd., Toronto Facility	Downsview, ON	16	30	3	209,597	0	0	0
26	Stelco McMaster Ltée	Contrecoeur, QC	29	33	2	0	0	0	0
27	Hudson Bay Mining and Smelting Co. Ltd., Metallurgical Complex	Flin Flon, MB	29	33	3	165,930	714	0	0
28	Algoma Steel Inc., Main Works	Sault Ste. Marie, ON	29	33	4	164,237	40	0	100
29	René Matériaux Composites Ltée	St-Éphrem-de-Beauce, QC	32	37	2	144,000	0	0	0
30	Sidbec-Dosco (Ispat) Inc., Sidbec-Feruni (Ispat)	Contrecoeur, QC	29	33	3	0	0	0	142,420
31	Doorhandle Systems	Brampton, ON	55	37	2	0	0	0	0
32	Weyerhaeuser Canada Ltd., Drayton Valley OSB Mill	Drayton Valley, AB	25	24	2	138,930	0	0	0
33	Foamex Canada Inc.	Toronto, ON	16	30	2	137,895	0	0	0
34	Les Forges de Sorel Inc.	St-Joseph-de-Sorel, QC	30	34	2	204	0	0	0
35	Wolverine Tube (Canada) Inc.	London, ON	29	33	1	133,212	0	0	0
36	Ivaco Rolling Mills	L'Orignal, ON	29	33	3	0	0	0	0
37	Imperial Oil, Sarnia Chemical Plant	Sarnia, ON	37	28	5	66,541	157	0	0
38	A.G.Simpson Co Ltd.	Oshawa, ON	32	34	3	0	0	0	0
39	Gerdau Courtice Steel Inc., Courtice Steel Inc.	Cambridge, ON	29	33	2	1,929	0	0	0
40	Mitsubishi Electronics Industries Canada Inc.	Midland, ON	33	36	2	12,277	146	0	0
41	Weyerhaeuser Canada Ltd., Edson OSB Mill	Edson, AB	25	24	2	114,740	0	0	0
42	Dow Chemical Canada Inc., Western Canada Operations	Fort Saskatchewan, AB	37	28	12	38,153	1	0	610
43	Shell Canada Products Ltd., Sarnia Manufacturing Centre	Corunna, ON	36	29	4	78,193	55	0	145
44	National-Standard Co. of Canada Ltd., Guelph Plant (70)	Guelph, ON	30	33	1	0	0	0	0
45	Fraser Papers Inc (Canada)	Edmundston, NB	27	26	4	7,340	0	0	0
46	Uniboard Canada Inc., Unires	Val d'Or, QC	37	28	1	632	0	0	0
47	PPG Canada Inc., Works 84	Owen Sound, ON	35	32	1	0	0	0	0
48	Mirolin Industries	Toronto, ON	16	30	2	104,980	0	0	0
49	Domtar Papers, Cornwall Business Unit	Cornwall, ON	27	26	1	104,409	2	0	0
50	Uniboard Canada Inc.	Mont-Laurier, QC	25	24	1	71,386	0	0	0
	Subtotal				**142**	**4,742,727**	**240,143**	**386,300**	**1,339,489**
	% of the Following Totals				**13.1**	**54.4**	**73.4**	**88.5**	**86.9**
	Total of All Matched NPRI Carcinogens				**1,085**	**8,714,308**	**327,360**	**436,273**	**1,541,066**

† Carcinogenic substances are those chemicals or chemical compounds listed in either the International Agency for Research on Cancer (IARC) Monographs or the US National Toxicological Program (NTP) Annual Report on Carcinogens. A chemical (and its compounds) is included if the chemical or any of its compounds is designated carcinogenic.

* Chemicals accounting for more than 70% of total releases and transfers of carcinogens from the facility.

➤ UIJ=underground injection

Rank	Total Releases (kg)	Treatment/ Destruction (kg)	Sewage/ POTW (kg)	Disposal/ Containment (kg)	Total Transfers (kg)	Total Releases and Transfers (kg)	Major Chemicals Reported (Primary Media/Transfers)*
1	6,491	0	0	888,042	888,042	894,533	Chromium and compounds (transfers to disposal)
2	233,261	0	8	397,200	397,208	630,469	Lead and compounds (transfers to disposal, land)
3	570,772	0	0	48,061	48,061	618,833	Acetaldehyde (UIJ, air), Vinyl acetate (UIJ)
4	457,530	0	333	108,926	109,259	566,789	Benzene (air)
5	234,615	0	0	238,340	238,340	472,955	Asbestos (transfers to disposal), Benzene (air)
6	393,700	0	0	0	0	393,700	Lead and compounds (air)
7	2,357	0	80	376,370	376,450	378,807	Lead and compounds (transfers to disposal)
8	23,190	355,270	0	0	355,270	378,460	Chromium/Nickel and compounds (transfers to treatment)
9	366,565	0	0	0	0	366,565	Dichloromethane (air)
10	114,557	3,321	0	189,180	192,500	307,057	Chromium and compounds (transfers to disposal, land)
11	214,262	72,416	0	0	72,416	286,678	Asbestos, Benzene (land)
12	2,459	542	269	267,880	268,691	271,150	Lead and compounds (transfers to disposal)
13	162,400	36,500	0	68,000	104,500	266,900	1,3-Butadiene, Benzene (air), Asbestos (transfers to disposal)
14	251,600	400	0	0	400	252,000	Chromium and compounds (land)
15	246,420	0	0	0	0	246,420	Trichloroethylene (air)
16	238,953	0	0	0	0	238,953	Dichloromethane (air)
17	230,802	0	0	0	0	230,802	Dichloromethane (air)
18	230,540	0	0	0	0	230,540	Lead and compounds (land)
19	229,000	0	0	0	0	229,000	Formaldehyde (water)
20	0	0	0	228,000	228,000	228,000	Lead and compounds (transfers to disposal)
21	10,488	0	0	213,670	213,670	224,158	Lead and compounds (transfers to disposal)
22	218,707	0	0	0	0	218,707	Dichloromethane (air)
23	217,440	0	0	0	0	217,440	Lead and compounds (land)
24	215,858	0	0	0	0	215,858	Nickel/Lead and compounds (air)
25	209,711	0	0	0	0	209,711	Dichloromethane (air)
26	970	194,500	0	0	194,500	195,470	Lead and compounds (transfers to treatment)
27	166,644	0	0	0	0	166,644	Lead and compounds (air)
28	165,277	0	0	0	0	165,277	Benzene (air)
29	144,000	0	0	0	0	144,000	Styrene, Dichloromethane (air)
30	142,420	0	0	0	0	142,420	Lead and compounds (land)
31	0	139,402	1,409	0	140,810	140,810	Chromium/Nickel and compounds (transfers to treatment)
32	138,930	0	0	0	0	138,930	Formaldehyde (air)
33	137,960	0	0	0	0	137,960	Dichloromethane (air)
34	204	125,020	0	10,040	135,060	135,264	Chromium and compounds (transfers to treatment)
35	133,212	0	0	0	0	133,212	Trichloroethylene (air)
36	684	0	0	132,440	132,440	133,124	Lead and compounds (transfers to disposal)
37	66,737	0	0	61,330	61,330	128,067	Asbestos (transfers to disposal), Benzene (air)
38	400	90	790	126,640	127,520	127,920	Nickel and compounds (transfers to disposal)
39	1,929	0	0	125,670	125,670	127,599	Lead and compounds (transfers to disposal)
40	12,423	0	0	106,657	106,657	119,080	Lead and compounds (transfers to disposal)
41	114,740	0	0	0	0	114,740	Formaldehyde (air)
42	38,764	160	0	73,000	73,160	111,924	Asbestos (transfers to disposal), 1,2-Dichloroethane (air)
43	78,614	0	0	31,610	31,610	110,224	Benzene (air), Asbestos (transfers to disposal)
44	0	0	0	110,000	110,000	110,000	Lead and compounds (transfers to disposal)
45	7,340	71,306	0	29,704	101,010	108,350	Formaldehyde (transfers to treatment), Asbestos (transfers to disposal)
46	632	105,000	0	0	105,000	105,632	Formaldehyde (transfers to treatment)
47	0	0	0	105,000	105,000	105,000	Chromium and compounds (transfers to disposal)
48	104,980	0	0	0	0	104,980	Dichloromethane, Styrene (air)
49	104,411	0	0	0	0	104,411	Benzene (air)
50	71,386	32,520	0	0	32,520	103,906	Formaldehyde (air, transfers to treatment)
	6,714,335	**1,136,447**	**2,889**	**3,935,760**	**5,075,094**	**11,789,429**	
	60.7	**66.4**	**3.6**	**77.0**	**73.5**	**65.7**	
	11,052,610	**1,710,850**	**81,238**	**5,111,355**	**6,903,443**	**17,956,053**	

Table 5–27

M 1996

Top 50 TRI Facilities with Largest Total Releases and Transfers of Known or Suspected Carcinogens†

Rank	Facility	City, State	US SIC Code	Number of Forms	Total Air Emissions (kg)	Surface Water Discharges (kg)	Underground Injection (kg)	On-site Land Releases (kg)
1	American Chrome & Chemicals, Harrisons & Crossfield	Corpus Christi, TX	28	1	2,063	113	0	5,124,717
2	Occidental Chemical Corp., Occidental Petroleum Corp.	Castle Hayne, NC	28	1	2,967	15	0	4,081,769
3	ASARCO Inc., Ray Complex/Hayden Smelter	Hayden, AZ	33	4	95,508	0	0	929,049
4	Monsanto Co.	Luling, LA	28	2	8,753	0	2,540,363	0
5	Pharmacia & Upjohn Co.	Portage, MI	28	4	91,912	116	22,789	0
6	ASARCO Inc.	East Helena, MT	33	4	29,062	596	0	1,866,876
7	ASARCO Inc., Glover Plant	Annapolis, MO	33	4	150,576	14	0	1,295,185
8	Angus Chemical Co.	Sterlington, LA	28	4	13,698	2,040	1,361,431	0
9	Cyprus Miami Mining, Cyprus Amax Minerals Co.	Claypool, AZ	33	7	13,197	0	0	1,294,240
10	Zinc Corp. of America, Horsehead Industries Inc.	Monaca, PA	33	4	5,879	15	0	0
11	BP Chemicals Inc. Green Lake, BP America Inc.	Port Lavaca, TX	28	5	21,386	0	1,222,494	3
12	BP Chemicals Inc.	Lima, OH	28	10	43,701	0	1,151,760	0
13	Eastman Kodak Co., Kodak Park	Rochester, NY	38	9	1,119,503	22,802	0	39
14	Aquaglass Corp., Masco Corp.	Adamsville, TN	30	1	1,046,797	0	0	0
15	General Battery Corp., Exide Corp.	Reading, PA	33	3	926	878	0	0
16	Cytec Industries Inc.	Westwego, LA	28	5	8,040	592	987,664	0
17	Glenbrook Nickel Co., Cominco American Inc.	Riddle, OR	33	1	17,061	7	0	905,522
18	Kennecott Utah Copper, Kennecott Holdings Corp.	Magna, UT	33	5	9,776	454	0	731,642
19	Quemetco Inc., RSR Corp.	City of Industry, CA	33	3	837	10	0	0
20	Xerox Corp.	Webster, NY	35	3	21,698	0	0	0
21	Upjohn Mfg. Co., Pharmacia & Upjohn Inc.	Arecibo, PR	28	2	455,125	0	0	0
22	Foamex L.P., Div. of Kihi	Corry, PA	30	2	756,420	0	0	0
23	DuPont Sabine River Works	Orange, TX	28	9	207,105	414	45,737	0
24	Quemetco Inc., RSR Corp.	Indianapolis, IN	33	3	1,879	0	0	0
25	Shell Oil Co.	Deer Park, TX	28	17	85,043	3	0	207
26	Sequentia Inc.	Grand Junction, TN	30	1	40,710	0	0	0
27	Carpenter Co., Tupelo Div.	Verona, MS	30	2	689,399	0	0	0
28	Doe Run Co., Herculaneum Smelter, Renco Group Inc.	Herculaneum, MO	33	6	92,688	75	0	596,449
29	Monsanto Co., Chocolate Bayou	Alvin, TX	28	3	12,307	0	645,125	0
30	FMC Corp.	Pocatello, ID	28	4	1,410	0	0	617,211
31	Thomson Consumer Electronics Inc.	Circleville, OH	32	2	1,104	35	0	0
32	GE Plastics Co., General Electric Co.	Mount Vernon, IN	28	6	569,148	259	0	0
33	Abbott Chemicals Inc.	Barceloneta, PR	Mult.	1	585,261	0	0	0
34	Noltex L.L.C., Mitsubishi Chemical America Inc.	La Porte, TX	28	1	4,036	0	0	0
35	American Bumper & Mfg. Co.	Ionia, MI	34	3	1,844	0	0	0
36	Northwestern Steel & Wire Co.	Sterling, IL	33	3	4,998	299	0	528,345
37	Boeing Co.	Wichita, KS	Mult.	6	350,141	231	0	0
38	Allegheny Ludlum Corp.	New Castle, IN	33	2	231	227	0	0
39	Elkem Metals Co.	Marietta, OH	33	4	14,521	5,896	0	441,723
40	Southwire Co.	Carrollton, GA	Mult.	14	4,473	106	0	0
41	Quality Chemicals Inc., Chemfirst Corp.	Tyrone, PA	28	1	1,503	0	0	0
42	Hydrite Chemical Co.	Cottage Grove, WI	28	4	2,363	0	0	0
43	Sterling Chemicals Inc.	Texas City, TX	28	10	69,611	0	387,913	0
44	General Electric Co.	Ottawa, IL	28	4	460,365	39	0	0
45	Foamex International Inc.	Milan, TN	30	1	457,282	0	0	0
46	Dow Chemical Co.	Freeport, TX	28	21	349,937	47,669	0	46,408
47	C&D Powercom Inc., C&D Charter Power Sys. Inc.	Conyers, GA	36	1	535	0	0	0
48	Nu-Foam Products, Ohio Decorative Products Inc.	Chattanooga, TN	30	2	420,896	0	0	0
49	Albemarle Corp.	Orangeburg, SC	28	2	241,492	3,129	0	2,358
50	Weyerhaeuser Co.	Longview, WA	Mult.	6	340,485	62,013	0	0
	Subtotal			**223**	**8,925,649**	**148,047**	**8,365,276**	**18,461,743**
	% of the Following Totals			**1.4**	**10.9**	**15.3**	**87.0**	**81.7**
	Total of All Matched TRI Carcinogens			**15,679**	**82,201,211**	**968,754**	**9,617,911**	**22,593,021**

† Carcinogenic substances are those chemicals or chemical compounds listed in either the International Agency for Research on Cancer (IARC) Monographs or the US National Toxicological Program (NTP) Annual Report on Carcinogens. A chemical (and its compounds) is included if the chemical or any of its compounds is designated carcinogenic.

* Chemicals accounting for more than 70% of total releases and transfers of carcinogens from the facility.

➤ One facility, Thomson Consumer Electronics, Dunmore, PA, reported 3.1 million kg of transfers to disposal of lead compounds. It has been omitted from this table.

➤ UIJ=underground injection

Rank	Total Releases (kg)	Treatment/ Destruction (kg)	Sewage/ POTW (kg)	Disposal/ Containment (kg)	Total Transfers (kg)	Total Releases and Transfers (kg)	Major Chemicals Reported (Primary Media/Transfers)*
1	5,126,893	24,036	0	3,129	27,166	5,154,059	Chromium and compounds (land)
2	4,084,751	4,535	0	0	4,535	4,089,286	Chromium and compounds (land)
3	1,024,557	2,593,802	9	0	2,593,811	3,618,368	Lead and compounds (transfers to treatment)
4	2,549,116	5,442	0	0	5,442	2,554,558	Formaldehyde (UIJ)
5	114,816	1,708,572	148,186	4,748	1,861,506	1,976,322	Dichloromethane (transfers to treatment)
6	1,896,534	0	7	0	7	1,896,541	Lead and compounds (land)
7	1,445,775	0	0	0	0	1,445,775	Lead and compounds (land)
8	1,377,169	33,046	0	0	33,046	1,410,215	Formaldehyde (UIJ)
9	1,307,438	0	0	0	0	1,307,438	Lead/Chromium and compounds (land)
10	5,894	3,935	0	1,261,751	1,265,686	1,271,580	Lead/Nickel and compounds (transfers to disposal)
11	1,243,883	328	0	0	328	1,244,211	Acrylamide, Acrylonitrile (UIJ)
12	1,195,460	5,018	0	290	5,308	1,200,769	Acrylamide, Acrylonitrile (UIJ)
13	1,142,344	4,537	0	58	4,595	1,146,940	Dichloromethane (air)
14	1,046,797	0	0	0	0	1,046,797	Styrene (air)
15	1,803	704,322	0	327,065	1,031,388	1,033,191	Lead and compounds (transfers to treatment, disposal)
16	996,296	625	0	2	628	996,924	Acrylamide (UIJ)
17	922,590	0	0	0	0	922,590	Nickel and compounds (land)
18	741,871	0	0	119,252	119,252	861,122	Lead/Arsenic and compounds (land)
19	847	0	72	847,166	847,238	848,084	Lead and compounds (transfers to disposal)
20	21,698	5,481	20	818,954	824,455	846,153	Dichloromethane (transfers to disposal)
21	455,125	340,136	21,814	0	361,950	817,075	Dichloromethane (air, transfers to treatment)
22	756,420	1,813	0	0	1,813	758,233	Dichloromethane (air)
23	253,255	105,937	0	388,305	494,242	747,497	Nickel and compounds (transfers to disposal), Vinyl acetate (air)
24	1,879	0	55	743,311	743,366	745,245	Lead and compounds (transfers to disposal)
25	85,253	634,932	0	177	635,109	720,362	Epichlorohydrin (transfers to treatment)
26	40,710	0	0	657,275	657,275	697,985	Styrene (transfers to disposal)
27	689,399	752	0	0	752	690,151	Dichloromethane (air)
28	689,212	0	369	0	369	689,581	Lead and compounds (land)
29	657,431	0	0	0	0	657,431	Acrylonitrile (UIJ)
30	618,621	0	0	24	24	618,645	Chromium/Cadmium and compounds (land)
31	1,139	168,317	0	439,312	607,629	608,768	Lead and compounds (transfers to disposal)
32	569,407	19,368	0	7,125	26,493	595,900	Dichloromethane (air)
33	585,261	1,533	16	0	1,549	586,810	Dichloromethane (air)
34	4,036	547,834	317	0	548,152	552,188	Vinyl acetate (transfers to treatment)
35	1,844	545,574	1,838	0	547,412	549,256	Nickel and compounds (transfers to treatment)
36	533,642	1,224	0	0	1,224	534,866	Lead/Chromium and compounds (land)
37	350,372	128,578	118	44,104	172,800	523,172	Tetrachloroethylene, Trichloroethylene (air)
38	458	0	0	512,472	512,472	512,930	Chromium/Nickel and compounds (transfers to disposal)
39	462,140	0	0	43,537	43,537	505,678	Chromium and compounds (land)
40	4,579	401,032	18	95,841	496,890	501,469	Lead and compounds (transfers to treatment)
41	1,503	497,742	0	0	497,742	499,245	Carbon tetrachloride (transfers to treatment)
42	2,363	476,259	0	0	476,259	478,621	Trichloroethylene, Dichloromethane (transfers to treatment)
43	457,524	10,657	61	9,311	20,029	477,553	Acrylamide, Acrylonitrile (UIJ)
44	460,404	0	0	116	116	460,520	Styrene, Acrylonitrile (air)
45	457,282	150	0	0	150	457,432	Dichloromethane (air)
46	444,015	7,436	0	0	7,436	451,451	1,2-Dichloroethane, Epichlorohydrin, Dichloromethane, Benzene, Propylene oxide, 1,3-Butadiene (air)
47	535	431,778	0	0	431,778	432,313	Lead and compounds (transfers to treatment)
48	420,896	0	0	0	0	420,896	Dichloromethane (air)
49	246,980	167,800	0	0	167,800	414,780	Dichloromethane (air, transfers to treatment)
50	402,498	113	0	8,728	8,842	411,339	Acetaldehyde, Chloroform (air)
	35,900,716	**9,582,648**	**172,902**	**6,332,050**	**16,087,600**	**51,988,316**	
	31.1	**39.4**	**7.3**	**22.0**	**29.0**	**30.4**	
	115,380,897	**24,339,167**	**2,354,088**	**28,834,946**	**55,528,201**	**170,909,098**	

5.4.2 Metals

Releases of Metals

The 19 metals and their compounds in the matched data set amounted to a higher proportion of TRI releases (17 percent) than of NPRI releases (14 percent). Zinc and manganese and their compounds ranked first and second for total releases in both NPRI and TRI (**Tables 5–28**, p. 150 and **5–29**, p. 151).

NPRI and TRI facilities reported similar patterns of releases of metals and their compounds. Most releases occurred as on-site land releases in both PRTRs, although NPRI facilities reported higher proportions of their releases of metals and compounds to air and surface waters (**Figure 5–13**).

Transfers of Metals

Unlike releases of metals, a larger proportion of NPRI transfers consisted of metals and their compounds (61 percent) than was the case in TRI (46 percent). As with releases, zinc and manganese and their compounds ranked first and second for total transfers in both PRTRs (**Tables 5–30**, p. 152 and **5–31**, p. 153).

The general pattern of metal transfers was also similar in the two systems, with the largest transfers occurring to disposal/containment, and nearly all of the rest sent to treatment/destruction (**Figure 5–14**).

Releases and Transfers of Metals

About one-third of the forms submitted in both NPRI and TRI, in the 1996 matched data set, were for metals and their compounds. Reporting of these substances accounted for 30 percent of all releases and transfers in NPRI and 25 percent in TRI. Releases and transfers of zinc and its compounds, ranking first among metals, totaled more than twice the amount of second-ranked manganese and its compounds in both PRTRs (**Tables 5–32**, p. 154 and **5–33**, p. 155).

Top Facilities for Releases and Transfers of Metals

Releases. Fifty facilities reported almost all the NPRI releases of metals and their compounds in the matched data set for 1996. These facilities reported 96 percent or more of the NPRI air emissions, surface water discharges, and on-site land releases of metals and their compounds. While the top TRI facilities also accounted for a large majority of total releases of metals, they reported a smaller proportion of the TRI air emissions (33 percent) and surface water discharges (37 percent, see **Figure 5–15** and **Tables 5–34**, pp. 156–57 and **5–35**, pp. 158–59).

Releases and Transfers. Fifty NPRI facilities reported the great majority (93 percent) of total releases and transfers of metals and their compounds in 1996. In TRI, reporting by the 50 facilities with the largest total releases and transfers of these substances accounted for 64 percent of the TRI total. Most of these facilities—32 of the NPRI top 50 and 38 of the TRI top 50—were primary metal producers (US SIC code 33, see **Figure 5–16** and **Tables 5–36**, pp. 160–61 and **5–37**, pp. 162–63).

[Text continues on p. 164.]

Figure 5–13
M 1996
NPRI and TRI Releases of Metals and their Compounds

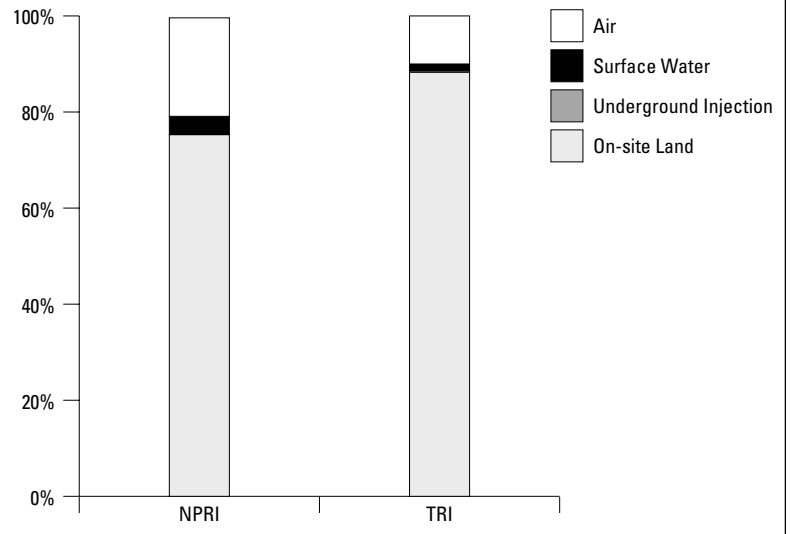


Figure 5–14
M 1996
NPRI and TRI Transfers of Metals and their Compounds

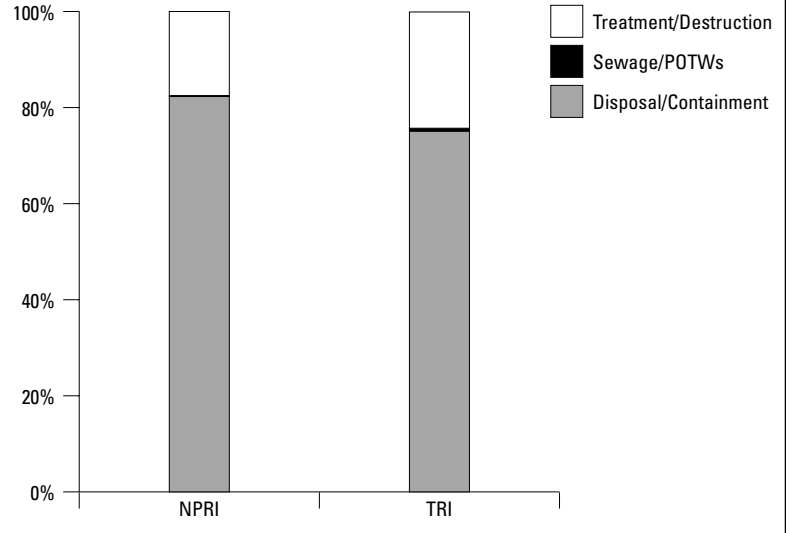
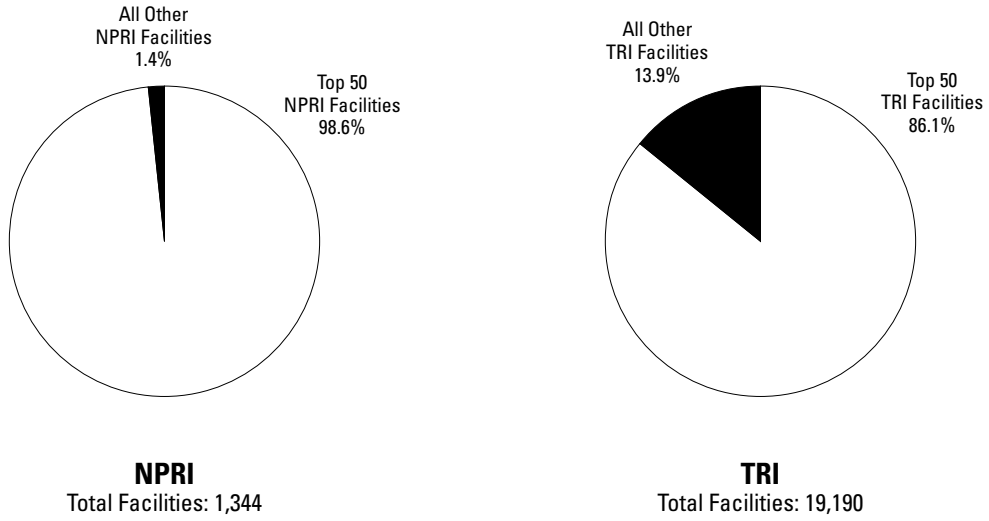


Figure 5–15
M 1996

NPRI and TRI Total Releases of Metals and their Compounds, Top 50 Facilities and All Others

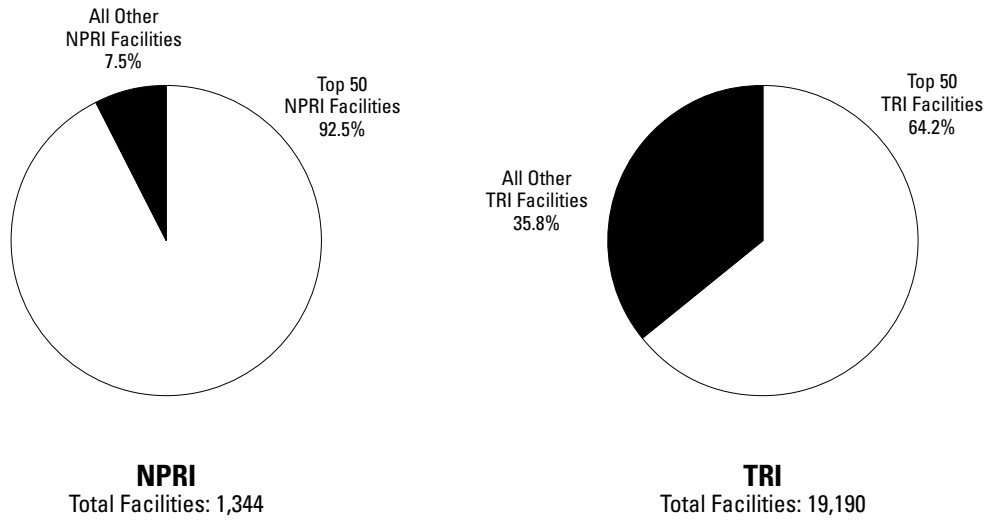


NPRI
Total Facilities: 1,344

TRI
Total Facilities: 19,190

Figure 5–16
M 1996

NPRI and TRI Total Releases and Transfers of Metals and their Compounds, Top 50 Facilities and All Others



NPRI
Total Facilities: 1,344

TRI
Total Facilities: 19,190

Table 5–28

M 1996

NPRI Releases of Metals and their Compounds

CAS Number	Chemical	Total Air Emissions (kg)	Surface Water Discharges (kg)	Underground Injection (kg)	On-site Land Releases (kg)	Total Releases (kg)	% of Total for Metals
—	Zinc (and its compounds)	616,629	105,297	334	4,918,575	5,648,068	49.7
—	Manganese (and its compounds)	63,939	231,904	0	1,577,548	1,882,245	16.5
—	Lead (and its compounds)	560,640	6,124	45	820,693	1,393,051	12.2
—	Copper (and its compounds)	431,233	14,263	10	234,312	684,293	6.0
7429-90-5	Aluminum (fume or dust)	18,662	0	0	477,300	499,143	4.4
—	Chromium (and its compounds)	16,565	16,896	200	454,030	493,593	4.3
—	Nickel (and its compounds)	275,954	49,972	9	67,675	396,159	3.5
7440-62-2	Vanadium (fume or dust)	187,695	100	0	1,179	189,526	1.7
—	Arsenic (and its compounds)	123,216	1,581	0	0	125,128	1.1
—	Cobalt (and its compounds)	10,197	1,840	0	13,309	25,646	0.2
—	Cadmium (and its compounds)	17,750	522	0	0	18,952	0.2
—	Antimony (and its compounds)	8,162	7	0	321	9,516	0.1
—	Selenium (and its compounds)	3,300	1,978	0	0	5,490	0.0
1313-27-5	Molybdenum trioxide	1,516	0	0	0	1,736	0.0
—	Silver (and its compounds)	1,010	26	0	10	1,203	0.0
1344-28-1	Aluminum oxide (fibrous forms)	200	0	0	1	325	0.0
7550-45-0	Titanium tetrachloride	86	0	0	0	86	0.0
—	Mercury (and its compounds)	26	6	0	0	34	0.0
	Subtotal	**2,336,780**	**430,516**	**598**	**8,564,953**	**11,374,194**	**100.0**
	% of the Following Totals	**3.7**	**8.4**	**0.0**	**95.8**	**13.8**	
	Total for All Matched NPRI Chemicals	**63,590,706**	**5,128,134**	**4,812,379**	**8,936,491**	**82,596,460**	

Table 5–29

M 1996

TRI Releases of Metals and their Compounds

CAS Number	Chemical	Total Air Emissions (kg)	Surface Water Discharges (kg)	Underground Injection (kg)	On-site Land Releases (kg)	Total Releases (kg)	% of Total for Metals
—	Zinc (and its compounds)	3,387,061	488,278	58,729	46,096,185	50,030,253	37.7
—	Manganese (and its compounds)	4,064,808	915,423	8,025	22,761,845	27,750,101	20.9
—	Copper (and its compounds)	3,122,784	48,981	154,070	23,317,789	26,643,624	20.1
—	Chromium (and its compounds)	403,529	322,479	16,976	12,199,556	12,942,540	9.8
—	Lead (and its compounds)	817,653	28,045	360	6,791,505	7,637,563	5.8
7429-90-5	Aluminum (fume or dust)	763,323	22,217	0	1,756,420	2,541,960	1.9
—	Nickel (and its compounds)	318,459	39,922	41,044	1,795,732	2,195,157	1.7
—	Antimony (and its compounds)	51,224	18,265	6,307	897,996	973,792	0.7
—	Arsenic (and its compounds)	70,258	2,026	27,791	838,905	938,980	0.7
—	Cadmium (and its compounds)	20,256	2,097	37	250,996	273,386	0.2
1313-27-5	Molybdenum trioxide	89,051	12,700	95,193	32,496	229,440	0.2
1344-28-1	Aluminum oxide (fibrous forms)	48,467	229	0	162,200	210,896	0.2
—	Cobalt (and its compounds)	28,677	14,644	7,219	130,326	180,866	0.1
—	Selenium (and its compounds)	21,455	1,134	1,406	95,812	119,807	0.1
—	Silver (and its compounds)	11,156	3,762	168	23,582	38,668	0.0
7550-45-0	Titanium tetrachloride	13,991	0	0	0	13,991	0.0
—	Mercury (and its compounds)	7,754	245	4	244	8,247	0.0
7440-62-2	Vanadium (fume or dust)	771	2	0	7	780	0.0
1314-20-1	Thorium dioxide	0	0	0	0	0	0.0
	Subtotal	**13,240,677**	**1,920,449**	**417,329**	**117,151,596**	**132,730,051**	**100.0**
	% of the Following Totals	**2.6**	**2.6**	**0.6**	**85.6**	**17.0**	
	Total for All Matched TRI Chemicals	**499,678,471**	**73,614,363**	**70,427,564**	**136,901,554**	**780,621,952**	

Table 5–30

M 1996

NPRI Transfers of Metals and their Compounds

CAS Number	Chemical	Treatment/ Destruction (kg)	Sewage/ POTW (kg)	Disposal/ Containment (kg)	Total Transfers (kg)	% of Total for Metals
—	Zinc (and its compounds)	2,809,386	11,090	9,694,801	12,515,277	49.4
—	Manganese (and its compounds)	515,746	4,147	6,070,014	6,589,907	26.0
—	Lead (and its compounds)	196,217	2,376	2,057,027	2,255,620	8.9
—	Chromium (and its compounds)	575,785	7,318	1,670,586	2,253,689	8.9
—	Copper (and its compounds)	88,681	4,495	658,035	751,211	3.0
—	Nickel (and its compounds)	216,967	11,427	272,761	501,155	2.0
7429-90-5	Aluminum (fume or dust)	0	1,360	216,873	218,233	0.9
1344-28-1	Aluminum oxide (fibrous forms)	28	0	118,472	118,500	0.5
—	Arsenic (and its compounds)	1,264	161	46,260	47,685	0.2
—	Selenium (and its compounds)	0	9,821	24,712	34,533	0.1
1313-27-5	Molybdenum trioxide	15,290	566	1,841	17,697	0.1
—	Cobalt (and its compounds)	2,370	10	8,477	10,857	0.0
—	Mercury (and its compounds)	4,440	0	5,173	9,613	0.0
—	Antimony (and its compounds)	11	70	8,153	8,234	0.0
—	Cadmium (and its compounds)	0	8	2,775	2,783	0.0
—	Silver (and its compounds)	0	188	41	229	0.0
7550-45-0	Titanium tetrachloride	5	0	0	5	0.0
7440-62-2	Vanadium (fume or dust)	0	0	1	1	0.0
	Subtotal	**4,426,190**	**53,037**	**20,856,002**	**25,335,229**	**100.0**
	% of the Following Totals	**32.6**	**1.1**	**90.6**	**61.0**	
	Total for All Matched NPRI Chemicals	**13,571,799**	**4,943,234**	**23,017,654**	**41,532,687**	

Table 5–31

M 1996

TRI Transfers of Metals and their Compounds

CAS Number	Chemical	Treatment/ Destruction (kg)	Sewage/ POTW (kg)	Disposal/ Containment (kg)	Total Transfers (kg)	% of Total for Metals
—	Zinc (and its compounds)	19,512,938	194,100	48,800,815	68,507,854	46.6
—	Manganese (and its compounds)	3,475,948	179,423	18,426,293	22,081,664	15.0
—	Lead (and its compounds)	6,383,793	21,542	10,841,028	17,246,363	11.7
—	Copper (and its compounds)	1,410,033	238,345	9,714,108	11,362,486	7.7
—	Chromium (and its compounds)	1,791,866	134,465	7,562,568	9,488,899	6.4
—	Nickel (and its compounds)	1,326,369	81,408	3,723,600	5,131,377	3.5
1344-28-1	Aluminum oxide (fibrous forms)	16,469	602	4,242,086	4,259,157	2.9
7429-90-5	Aluminum (fume or dust)	68,763	5,784	3,513,816	3,588,363	2.4
—	Antimony (and its compounds)	409,215	53,041	2,004,228	2,466,484	1.7
—	Arsenic (and its compounds)	822,904	241	563,941	1,387,086	0.9
—	Cadmium (and its compounds)	103,225	1,427	425,648	530,300	0.4
1313-27-5	Molybdenum trioxide	163,664	29,003	285,099	477,766	0.3
—	Cobalt (and its compounds)	57,337	6,334	338,362	402,033	0.3
7550-45-0	Titanium tetrachloride	75,610	0	15,425	91,035	0.1
—	Selenium (and its compounds)	20,453	193	32,081	52,727	0.0
—	Silver (and its compounds)	16,128	1,201	14,569	31,898	0.0
7440-62-2	Vanadium (fume or dust)	773	91	17,524	18,388	0.0
—	Mercury (and its compounds)	6,549	7	11,739	18,295	0.0
1314-20-1	Thorium dioxide	0	998	0	998	0.0
	Subtotal	**35,662,037**	**948,205**	**110,532,931**	**147,143,173**	**100.0**
	% of the Following Totals	**32.2**	**1.1**	**89.1**	**45.8**	
	Total for All Matched TRI Chemicals	**110,901,271**	**86,130,663**	**124,047,657**	**321,079,591**	

Table 5–32

M 1996

NPRI Releases and Transfers of Metals and their Compounds

CAS Number	Chemical	Forms		Total Releases (kg)	Total Transfers (kg)	Total Releases and Transfers (kg)	% of Total for Metals
		Number	%				
—	Zinc (and its compounds)	307	21.5	5,648,068	12,515,277	18,163,345	49.5
—	Manganese (and its compounds)	233	16.4	1,882,245	6,589,907	8,472,152	23.1
—	Lead (and its compounds)	130	9.1	1,393,051	2,255,620	3,648,671	9.9
—	Chromium (and its compounds)	213	14.9	493,593	2,253,689	2,747,282	7.5
—	Copper (and its compounds)	225	15.8	684,293	751,211	1,435,504	3.9
—	Nickel (and its compounds)	137	9.6	396,159	501,155	897,314	2.4
7429-90-5	Aluminum (fume or dust)	36	2.5	499,143	218,233	717,376	2.0
7440-62-2	Vanadium (fume or dust)	12	0.8	189,526	1	189,527	0.5
—	Arsenic (and its compounds)	33	2.3	125,128	47,685	172,813	0.5
1344-28-1	Aluminum oxide (fibrous forms)	10	0.7	325	118,500	118,825	0.3
—	Selenium (and its compounds)	4	0.3	5,490	34,533	40,023	0.1
—	Cobalt (and its compounds)	23	1.6	25,646	10,857	36,503	0.1
—	Cadmium (and its compounds)	11	0.8	18,952	2,783	21,735	0.1
1313-27-5	Molybdenum trioxide	12	0.8	1,736	17,697	19,433	0.1
—	Antimony (and its compounds)	26	1.8	9,516	8,234	17,750	0.0
—	Mercury (and its compounds)	2	0.1	34	9,613	9,647	0.0
—	Silver (and its compounds)	7	0.5	1,203	229	1,432	0.0
7550-45-0	Titanium tetrachloride	4	0.3	86	5	91	0.0
	Subtotal	**1,425**	**100.0**	**11,374,194**	**25,335,229**	**36,709,423**	**100.0**
	% of the Following Totals	**33.2**		**13.8**	**61.0**	**29.6**	
	Total for All Matched NPRI Chemicals	**4,298**		**82,596,460**	**41,532,687**	**124,129,147**	

Table 5–33

M 1996

TRI Releases and Transfers of Metals and their Compounds

CAS Number	Chemical	Forms		Total Releases (kg)	Total Transfers (kg)	Total Releases and Transfers (kg)	% of Total for Metals
		Number	%				
—	Zinc (and its compounds)	2,932	15.0	50,030,253	68,507,854	118,538,107	42.4
—	Manganese (and its compounds)	2,554	13.0	27,750,101	22,081,664	49,831,765	17.8
—	Copper (and its compounds)	4,061	20.7	26,643,624	11,362,486	38,006,110	13.6
—	Lead (and its compounds)	1,640	8.4	7,637,563	17,246,363	24,883,926	8.9
—	Chromium (and its compounds)	3,154	16.1	12,942,540	9,488,899	22,431,439	8.0
—	Nickel (and its compounds)	2,760	14.1	2,195,157	5,131,377	7,326,534	2.6
7429-90-5	Aluminum (fume or dust)	310	1.6	2,541,960	3,588,363	6,130,323	2.2
1344-28-1	Aluminum oxide (fibrous forms)	48	0.2	210,896	4,259,157	4,470,053	1.6
—	Antimony (and its compounds)	673	3.4	973,792	2,466,484	3,440,276	1.2
—	Arsenic (and its compounds)	392	2.0	938,980	1,387,086	2,326,066	0.8
—	Cadmium (and its compounds)	143	0.7	273,386	530,300	803,686	0.3
1313-27-5	Molybdenum trioxide	158	0.8	229,440	477,766	707,206	0.3
—	Cobalt (and its compounds)	480	2.5	180,866	402,033	582,899	0.2
—	Selenium (and its compounds)	47	0.2	119,807	52,727	172,535	0.1
7550-45-0	Titanium tetrachloride	34	0.2	13,991	91,035	105,027	0.0
—	Silver (and its compounds)	138	0.7	38,668	31,898	70,566	0.0
—	Mercury (and its compounds)	34	0.2	8,247	18,295	26,541	0.0
7440-62-2	Vanadium (fume or dust)	14	0.1	780	18,388	19,169	0.0
1314-20-1	Thorium dioxide	1	0.0	0	998	998	0.0
	Subtotal	**19,573**	**100.0**	**132,730,051**	**147,143,173**	**279,873,224**	**100.0**
	% of the Following Totals	**33.8**		**17.0**	**45.8**	**25.4**	
	Total for All Matched TRI Chemicals	**57,927**		**780,621,952**	**321,079,591**	**1,101,701,543**	

Table 5–34

M 1996

The 50 NPRI Facilities with the Largest Total Releases of Metals and their Compounds

Rank	Facility	City, Province	SIC Codes Canada	SIC Codes US	Number of Forms	Total Air Emissions (kg)	Surface Water Discharges (kg)	Underground Injection (kg)	On-site Land Releases (kg)
1	Sidbec-Dosco (Ispat) Inc., acierie	Contrecoeur, QC	29	33	5	59,400	185	0	2,263,400
2	Gerdau MRM Steel Inc.	Selkirk, MB	29	33	4	22,367	0	0	2,008,700
3	Co-Steel Lasco	Whitby, ON	29	33	6	12,695	298	0	1,241,900
4	Métallurgie Noranda Inc., Fonderie Horne	Rouyn-Noranda, QC	29	33	10	657,650	18,900	0	0
5	AltaSteel Ltd.	Edmonton, AB	29	33	5	11,216	37	0	597,088
6	Lake Erie Steel Company Ltd.	Nanticoke, ON	29	33	8	15,660	2,769	0	462,800
7	Sidbec-Dosco (Ispat) Inc., Sidbec-Feruni (Ispat)	Contrecoeur, QC	29	33	5	0	0	0	457,180
8	Inco Limited, Copper Cliff Smelter Complex	Copper Cliff, ON	29	33	6	427,818	0	0	0
9	Hudson Bay Mining and Smelting Co. Ltd., Metallurgical Complex	Flin Flon, MB	29	33	5	413,595	3,327	0	0
10	Sydney Steel Corporation	Sydney, NS	29	33	8	0	300	0	330,200
11	Recyclage d'aluminium Québec Inc.	Bécancour, QC	29	33	1	0	0	0	275,000
12	Fonderies canadiennes d'acier Ltée	Montréal, QC	31	35	3	200	0	0	255,800
13	Produits forestiers Donohue Inc., usine de pâte Kraft	St-Félicien, QC	27	26	2	0	68,800	0	145,800
14	Recyclage d'aluminium Québec Inc., Ragueneau	Baie-Comeau, QC	29	33	1	0	0	0	185,000
15	North Atlantic Refining Ltd	Come By Chance, NF	36	29	5	130,533	0	0	0
16	Cezinc (Zinc électrolytique du Canada Limitée)	Salaberry-de-Valleyfield, QC	29	33	8	110,848	7,138	0	0
17	Sammi Atlas Inc., Atlas Specialty Steels	Welland, ON	29	33	4	232	1,523	0	113,596
18	Inco Limited, Manitoba Division	Thompson, MB	29	33	4	90,209	14,257	0	0
19	Imperial Oil, IOL Sarnia Refinery	Sarnia, ON	36	29	4	76,953	187	0	1,976
20	Esco Limited	Port Coquitlam, BC	29	33	3	311	0	0	65,409
21	Inco Limited, Port Colborne Refinery	Port Colborne, ON	29	33	5	1,002	1,070	0	55,325
22	Ford Motor Company, Windsor Casting Plant	Windsor, ON	29	33	5	1,830	51,700	0	0
23	Falconbridge Limited, Smelter Complex	Falconbridge, ON	29	33	8	42,385	3,347	0	39
24	Kronos Canada, Inc.	Varennes, QC	37	28	3	86	45,350	0	0
25	Stelco Inc., Hilton Works	Hamilton, ON	29	33	9	14,750	22,220	0	0
26	Inco Limited Central Mills	Copper Cliff, ON	29	33	2	0	36,430	0	0
27	Cartons St-Laurent Inc.	Latuque, QC	27	26	2	1,656	32,155	0	0
28	Weyerhaeuser Canada Ltd., Kamloops Pulp Division	Kamloops, BC	27	26	1	0	31,300	0	0
29	Shell Canada Products Ltd., Sarnia Manufacturing Centre	Corunna, ON	36	29	3	28,578	0	0	328
30	Metalex Products Ltd.	Richmond, BC	29	33	5	79	0	0	24,000
31	Weyerhaeuser Saskatchewan Ltd., Prince Albert Pulp & Paper	Prince Albert, SK	27	26	1	0	22,200	0	0
32	Noranda Mining and Exploration Inc., Brunswick Smelting Division	Belledune, NB	29	33	5	20,530	1,104	0	0
33	Weyerhaeuser Canada Ltd., Grande Prairie Operations	Grande Prairie, AB	04	24	1	0	19,370	0	0
34	Stelco McMaster Ltée	Contrecoeur, QC	29	33	5	16,280	0	0	0
35	Dofasco Inc.	Hamilton, ON	29	33	7	8,360	7,549	0	0
36	Wolverine Tube (Canada) Inc.	Fergus, ON	29	33	3	5,672	200	0	8,610
37	St. Anne-Nackawic Pulp Company Ltd.	Nackawic, NB	27	26	1	0	14,000	0	0
38	Riverside Brass Ltd.	New Hamburg, ON	29	33	3	13,000	0	0	0
39	QIT-Fer et Titane Inc.	Tracy, QC	29	33	3	12,900	0	0	0
40	Michelin North America (Canada) Inc.	Bridgewater, NS	15	30	2	0	100	0	12,612
41	Petro-Canada, raffinerie de Montréal	Montréal, QC	36	29	1	12,300	0	0	0
42	Gerdau Courtice Steel Inc., Courtice Steel Inc.	Cambridge, ON	29	33	6	11,940	0	0	0
43	Cobalt Refinery Company	Fort Saskatchewan, AB	29	33	4	370	0	0	10,890
44	Ivaco Rolling Mills	L'Orignal, ON	29	33	7	10,087	2	0	0
45	F.F. Soucy Inc.	Rivière-du-Loup, QC	27	26	2	0	10,600	0	0
46	Wabash Alloys	Toronto, ON	29	33	4	10,521	0	0	0
47	Spruce Falls Inc.	Kapuskasing/O'Brien, ON	27	26	1	1,705	996	0	7,800
48	Slater Steels, Hamilton Specialty Bar Division	Hamilton, ON	29	33	9	8,728	0	0	200
49	ICI Canada, ICI Explosifs	Brownsburg, QC	37	28	2	0	0	0	8,350
50	DuPont Canada Inc.	Maitland, ON	37	28	3	6,440	1,452	0	0
	Subtotal				**210**	**2,258,886**	**418,866**	**0**	**8,532,003**
	% of the Following Totals				**14.7**	**96.7**	**97.3**	**0.0**	**99.6**
	Total for All Matched NPRI Metals				**1,425**	**2,336,780**	**430,516**	**598**	**8,564,953**

* Chemicals accounting for more than 70% of total relases of metals from the facility.

Rank	Total Releases (kg)	Major Chemicals Reported (Primary Media)*
1	2,322,985	Zinc and compounds (land)
2	2,031,067	Zinc and compounds (land)
3	1,254,893	Zinc/Lead and compounds (land)
4	676,550	Lead/Copper/Zinc and compounds (air)
5	608,341	Zinc/Manganese and compounds (land)
6	481,240	Manganese and compounds (land)
7	457,180	Zinc/Lead and compounds (land)
8	427,818	Copper/Nickel and compounds (air)
9	416,922	Zinc/Lead and compounds (air)
10	331,280	Zinc/Manganese and compounds (land)
11	275,000	Aluminum (land)
12	256,000	Chromium and compounds (land)
13	214,600	Manganese and compounds (land, water)
14	185,000	Aluminum (land)
15	130,533	Vanadium (air)
16	118,880	Zinc and compounds (air)
17	115,351	Chromium and compounds (land)
18	104,466	Nickel and compounds (air)
19	79,116	Vanadium (air)
20	65,743	Manganese and compounds (land)
21	57,397	Copper/Nickel and compounds (land)
22	53,530	Zinc and compounds (water)
23	45,771	Nickel/Zinc/Copper and compounds (air)
24	45,436	Manganese and compounds (water)
25	37,720	Zinc and compounds (water), Manganese and compounds (air)
26	36,430	Nickel and compounds (water)
27	33,811	Manganese and compounds (water)
28	31,300	Manganese and compounds (water)
29	28,925	Vanadium, Nickel and compounds (air)
30	24,229	Lead/Zinc and compounds (land)
31	22,200	Manganese and compounds (water)
32	21,634	Lead and compounds (air)
33	19,370	Manganese and compounds (water)
34	17,410	Zinc and compounds (air)
35	15,909	Zinc and compounds (water, air), Manganese and compounds (water)
36	14,495	Zinc and compounds (land, air)
37	14,000	Chromium and compounds (water)
38	13,000	Zinc/Lead and compounds (air)
39	12,900	Manganese and compounds, Aluminum (air)
40	12,712	Zinc and compounds (land)
41	12,300	Vanadium (air)
42	11,940	Zinc/Lead and compounds (air)
43	11,260	Nickel/Zinc and compounds (land)
44	11,020	Zinc/Manganese and compounds (air)
45	10,600	Manganese and compounds (water)
46	10,521	Aluminum (air)
47	10,501	Manganese and compounds (land)
48	10,428	Zinc/Lead and compounds (air)
49	8,350	Aluminum (land)
50	7,892	Cobalt/Copper and compounds (air)
	11,215,956	
	98.6	
	11,374,194	

Table 5–35

M 1996

The 50 TRI Facilities with the Largest Total Releases of Metals and their Compounds

Rank	Facility	City, State	US SIC Code	Number of Forms	Total Air Emissions (kg)	Surface Water Discharges (kg)	Underground Injection (kg)	On-site Land Releases (kg)
1	ASARCO Inc.	East Helena, MT	33	9	45,844	927	0	20,113,797
2	Cyprus Miami Mining, Cyprus Amax Minerals Co.	Claypool, AZ	33	11	21,941	113	0	11,298,685
3	Northwestern Steel & Wire Co.	Sterling, IL	33	4	47,510	1,224	0	6,496,599
4	General Motors Corp., Powertrain Defiance	Defiance, OH	33	6	35,786	734	0	6,006,304
5	Elkem Metals Co.	Marietta, OH	33	5	218,149	326,984	0	4,763,719
6	American Chrome & Chemicals, Harrisons & Crossfield	Corpus Christi, TX	28	1	2,063	113	0	5,124,717
7	ASARCO Inc., Ray Complex/Hayden Smelter	Hayden, AZ	33	8	484,619	0	0	4,555,926
8	Phelps Dodge Hidalgo Inc., Phelps Dodge Corp.	Playas, NM	33	1	117,531	0	0	4,261,163
9	Kennecott Utah Copper, Kennecott Holdings Corp.	Magna, UT	33	8	64,265	1,927	0	4,121,891
10	Occidental Chemical Corp., Occidental Petroleum Corp.	Castle Hayne, NC	28	1	2,967	15	0	4,081,769
11	ASARCO Inc., Glover Plant	Annapolis, MO	33	6	158,230	35	0	3,871,963
12	Doe Run Co., Herculaneum Smelter, Renco Group Inc.	Herculaneum, MO	33	9	106,342	149	0	3,467,229
13	Chino Mines Co.	Hurley, NM	33	1	18,380	0	0	3,457,663
14	US Steel Gary Works, USX Corp.	Gary, IN	33	12	131,202	7,900	0	2,599,909
15	Granite City Steel, National Steel Corp.	Granite City, IL	33	6	21,822	5,397	0	2,592,722
16	FMC Corp.	Pocatello, ID	28	9	2,139	351	0	2,586,124
17	BHP Copper Metals Co., BHP Copper Co.	San Manuel, AZ	33	5	1,787,997	0	0	774,034
18	Kerr-McGee Chemical Corp. Electrolytic Plant, Kerr-McGee Corp	Hamilton, MS	33	3	3,583	11,211	0	2,335,782
19	USS Fairfield Works, USX Corp.	Fairfield, AL	33	8	6,323	2,681	0	1,859,434
20	Chemetals Inc., Comilog	New Johnsonville, TN	28	1	38,983	759	0	1,645,950
21	Louisiana Pigment Co. L.P., Kronos Louisiana Inc.	Westlake, LA	28	2	375	110	0	1,269,841
22	General Motors Corp., GMTG Saginaw Metal Casting	Saginaw, MI	33	6	19,257	1	0	999,955
23	Kerr-McGee Chemical Corp.	Henderson, NV	28	2	6,259	0	0	949,116
24	Glenbrook Nickel Co., Cominco American Inc.	Riddle, OR	33	1	17,061	7	0	905,522
25	Geneva Steel	Vineyard, UT	33	8	1,720	667	0	811,276
26	Keystone Steel & Wire Co., Keystone Consolidated Industries	Peoria, IL	33	3	597,497	542	0	165,402
27	Austeel Lemont Co. Inc.	Lemont, IL	33	5	23,420	227	0	644,666
28	Griffin Wheel Co. Columbus Plant, Amsted Ind. Inc.	Groveport, OH	33	2	8,163	0	0	639,904
29	Imco Recycling Inc.	Morgantown, KY	33	5	5,490	0	0	615,964
30	Bethlehem Steel Corp.	Sparrows Point, MD	33	6	7,937	21,638	0	514,104
31	American Steel Foundries, Amsted Industries Inc.	Granite City, IL	33	5	27,628	0	0	474,376
32	Griffin Wheel Co., Amsted Industries Inc.	Keokuk, IA	33	2	8,163	0	0	461,723
33	General Electric Co., Silicone Products	Waterford, NY	28	2	680	4,762	0	430,844
34	AK Steel Corp., AK Steel Holding	Middletown, OH	33	11	25,737	148	0	359,819
35	Griffin Wheel Co., Amsted Industries Inc.	Bessemer, AL	33	2	3,583	0	0	359,274
36	LTV Steel Co. Inc.	Cleveland, OH	33	5	8,039	2,187	0	350,753
37	Gulf States Steel Inc., GSS Holding Corp.	Gadsden, AL	33	7	19,549	13,673	0	304,308
38	WCI Steel Inc.	Warren, OH	33	5	4,404	358	0	324,649
39	Griffin Wheel Co., Amsted Industries Inc.	Kansas City, KS	33	2	3,583	0	0	315,904
40	Metal Mark Inc., Imco Recycling Inc.	Chicago Heights, IL	33	6	5,108	0	0	282,976
41	Caparo Steel, Caparo Inc.	Farrell, PA	33	5	5,036	277,698	0	0
42	LTV Steel Co. Inc.	East Chicago, IN	33	4	4,540	1,746	0	268,934
43	US Pipe & Foundry Co., Walter Industries Inc.	Birmingham, AL	33	1	454	0	0	272,109
44	Great Southern Paper Co., Georgia-Pacific Corp.	Cedar Springs, GA	26	1	39,002	2,177	0	222,222
45	Bethlehem Steel Corp.	Burns Harbor, IN	33	6	20,410	14,717	3,311	217,324
46	GNB Techs. Inc., Pacific Dunlop GNB Corp.	Frisco, TX	33	3	1,538	2	0	237,512
47	Hayes-Albion Corp., Harvard Industries Inc.	Albion, MI	33	3	11,146	6	0	225,705
48	Georgia-Pacific Paper Operations	Crossett, AR	26	1	142,383	506	0	93,236
49	Nucor Steel, Nucor Corp.	Jewett, TX	33	6	16,130	0	0	216,490
50	U.S. Vanadium Corp., Strategic Minerals Corp.	Hot Springs, AR	33	1	0	85	0	232,100
	Subtotal			**232**	**4,349,972**	**701,776**	**3,311**	**109,181,389**
	% of the Following Totals			**1.2**	**32.9**	**36.5**	**0.8**	**93.2**
	Total for All Matched TRI Metals			**19,573**	**13,240,677**	**1,920,449**	**417,329**	**117,151,595**

* Chemicals accounting for more than 70% of total releases of metals from the facility.

➤ Two TRI facilities reported in error. Gunderson Inc., Portland, OR, reported 2.8 million kg of air emissions of manganese and Tennessee Aluminum Processor Inc., Maury, PA, reported 720,000 kg of on-site releases to land of aluminum. They have been omitted from this table.

Rank	Total Releases (kg)	Major Chemicals Reported (Primary Media)*
1	20,160,568	Zinc and compounds (land)
2	11,320,739	Copper/Zinc and compounds (land)
3	6,545,333	Zinc/Manganese and compounds (land)
4	6,042,824	Zinc and compounds (land)
5	5,308,852	Manganese and compounds (land)
6	5,126,893	Chromium and compounds (land)
7	5,040,544	Copper/Zinc and compounds (land)
8	4,378,694	Copper and compounds (land)
9	4,188,084	Copper/Zinc and compounds (land)
10	4,084,751	Chromium and compounds (land)
11	4,030,228	Zinc/Lead and compounds (land)
12	3,573,720	Zinc and compounds (land)
13	3,476,044	Copper and compounds (land)
14	2,739,011	Zinc/Manganese and compounds (land)
15	2,619,941	Zinc and compounds (land)
16	2,588,615	Zinc and compounds (land)
17	2,562,031	Copper and compounds (air)
18	2,350,576	Manganese and compounds (land)
19	1,868,437	Zinc and compounds (land)
20	1,685,692	Manganese and compounds (land)
21	1,270,326	Manganese and compounds (land)
22	1,019,212	Zinc/Manganese and compounds (land)
23	955,374	Manganese and compounds (land)
24	922,590	Nickel and compounds (land)
25	813,663	Manganese/Zinc and compounds (land)
26	763,441	Zinc and compounds (air)
27	668,313	Zinc and compounds (land)
28	648,068	Manganese and compounds (land)
29	621,454	Aluminum (land)
30	543,678	Manganese and compounds (land)
31	502,005	Chromium and compounds/Aluminum (land)
32	469,887	Manganese and compounds (land)
33	436,286	Copper and compounds (land)
34	385,704	Manganese and compounds (land)
35	362,857	Manganese and compounds (land)
36	360,980	Zinc/Manganese and compounds (land)
37	337,531	Zinc/Manganese and compounds (land)
38	329,411	Manganese and compounds (land)
39	319,487	Manganese and compounds (land)
40	288,085	Aluminum (land)
41	282,734	Chromium and compounds (water)
42	275,220	Manganese and compounds (land)
43	272,562	Manganese and compounds (land)
44	263,401	Zinc and compounds (land)
45	255,762	Manganese and compounds (land)
46	239,052	Lead and compounds (land)
47	236,857	Manganese and compounds (land)
48	236,125	Zinc and compounds (air, land)
49	232,620	Zinc/Manganese and compounds (land)
50	232,185	Nickel and compounds (land)
	114,236,448	
	86.1	
	132,730,050	

Table 5–36

M 1996

Top 50 NPRI Facilities with Largest Total Releases and Transfers of Metals and their Compounds

Rank	Facility	City, Province	SIC Codes Canada	SIC Codes US	Number of Forms	Total Air Emissions (kg)	Surface Water Discharges (kg)	Underground Injection (kg)	On-site Land Releases (kg)
1	Co-Steel Lasco	Whitby, ON	29	33	6	12,695	298	0	1,241,900
2	Lake Erie Steel Company Ltd.	Nanticoke, ON	29	33	8	15,660	2,769	0	462,800
3	Stelco McMaster Ltée	Contrecoeur, QC	29	33	5	16,280	0	0	0
4	Dofasco Inc.	Hamilton, ON	29	33	7	8,360	7,549	0	0
5	Sidbec-Dosco (Ispat) Inc., acierie	Contrecoeur, QC	29	33	5	59,400	185	0	2,263,400
6	Gerdau MRM Steel Inc.	Selkirk, MB	29	33	4	22,367	0	0	2,008,700
7	Ivaco Rolling Mills	L'Orignal, ON	29	33	7	10,087	2	0	0
8	Slater Steels, Hamilton Specialty Bar Division	Hamilton, ON	29	33	9	8,728	0	0	200
9	Dominion Castings Ltd.	Hamilton, ON	29	33	3	6,291	100	0	0
10	Kronos Canada, Inc.	Varennes, QC	37	28	3	86	45,350	0	0
11	Zalev Brothers Limited	Windsor, ON	29	33	7	449	7	0	0
12	Gerdau Courtice Steel Inc., Courtice Steel Inc.	Cambridge, ON	29	33	6	11,940	0	0	0
13	Métallurgie Noranda Inc., Fonderie Horne	Rouyn-Noranda, QC	29	33	10	657,650	18,900	0	0
14	AltaSteel Ltd.	Edmonton, AB	29	33	5	11,216	37	0	597,088
15	Sammi Atlas Inc., Aciers inoxydables Atlas	Tracy, QC	29	33	5	1,090	750	0	0
16	Sammi Atlas Inc., Atlas Specialty Steels	Welland, ON	29	33	4	232	1,523	0	113,596
17	Sidbec-Dosco (Ispat) Inc., Sidbec-Feruni (Ispat)	Contrecoeur, QC	29	33	5	0	0	0	457,180
18	Ford Motor Company, Windsor Casting Plant	Windsor, ON	29	33	5	1,830	51,700	0	0
19	Inco Limited, Copper Cliff Smelter Complex	Copper Cliff, ON	29	33	6	427,818	0	0	0
20	Hudson Bay Mining and Smelting Co. Ltd., Metallurgical Complex	Flin Flon, MB	29	33	5	413,595	3,327	0	0
21	Tonolli Canada Limited	Mississauga, ON	29	33	1	2,307	50	0	0
22	Sydney Steel Corporation	Sydney, NS	29	33	8	0	300	0	330,200
23	Metalex Products Ltd.	Richmond, BC	29	33	5	79	0	0	24,000
24	Recyclage d'aluminium Québec Inc.	Bécancour, QC	29	33	1	0	0	0	275,000
25	Fonderies canadiennes d'acier Ltée	Montréal, QC	31	35	3	200	0	0	255,800
26	Dominion Colour Corporation	Ajax, ON	37	28	4	0	0	0	0
27	Produits forestiers Donohue Inc., usine de pâte Kraft	St-Félicien, QC	27	26	2	0	68,800	0	145,800
28	Doorhandle Systems	Brampton, ON	55	37	4	0	0	0	0
29	Les Forges de Sorel Inc.	St-Joseph-de-Sorel, QC	30	34	4	333	0	0	0
30	Recyclage d'aluminium Québec Inc., Ragueneau	Baie-Comeau, QC	29	33	1	0	0	0	185,000
31	A.G.Simpson Co Ltd.	Oshawa, ON	32	34	5	0	0	0	0
32	Cezinc (Zinc électrolytique du Canada Limitée)	Salaberry-de-Valleyfield, QC	29	33	8	110,848	7,138	0	0
33	North Atlantic Refining Ltd.	Come By Chance, NF	36	29	5	130,533	0	0	0
34	Dana Canada Inc., Spicer Driveshaft Division	Thorold, ON	32	37	2	0	0	0	0
35	Stelwire Ltd., Parkdale Works	Hamilton, ON	30	34	3	750	346	0	0
36	Cartons St-Laurent Inc.	Latuque, QC	27	26	2	1,656	32,155	0	0
37	National-Standard Co. of Canada Ltd., Guelph Plant (70)	Guelph, ON	30	33	2	0	0	0	0
38	Mitsubishi Electronics Industries Canada Inc.	Midland, ON	33	36	2	40	247	0	0
39	PPG Canada Inc., Works 84	Owen Sound, ON	35	32	1	0	0	0	0
40	Inco Limited, Manitoba Division	Thompson, MB	29	33	4	90,209	14,257	0	0
41	F.F. Soucy Inc.	Rivière-du-Loup, QC	27	26	2	0	10,600	0	0
42	Métallurgie Noranda, Affinerie CCR	Montréal-Est, QC	29	33	9	4,968	0	0	0
43	Imperial Oil, IOL Sarnia Refinery	Sarnia, ON	36	29	4	76,953	187	0	1,976
44	Coatings 85 Ltd.	Mississauga, ON	30	34	1	0	0	0	0
45	Weyerhaeuser Canada Ltd., Kamloops Pulp Division	Kamloops, BC	27	26	1	0	31,300	0	0
46	Stelco Inc., Hilton Works	Hamilton, ON	29	33	9	14,750	22,220	0	0
47	Maritime Steel and Foundries Limited	New Glasgow, NS	39	39	5	0	0	0	0
48	Esco Limited	Port Coquitlam, BC	29	33	3	311	0	0	65,409
49	QIT-Fer et Titane Inc.	Tracy, QC	29	33	3	12,900	0	0	0
50	Varity/Kelsey-Hayes Canada Ltd., Eureka Foundry Division	Woodstock, ON	29	33	1	1,433	0	0	0
	Subtotal				**220**	**2,134,044**	**320,097**	**0**	**8,428,049**
	% of the Following Totals				**15.4**	**91.3**	**74.4**	**0.0**	**98.4**
	Total of All Matched NPRI Metals				**1,425**	**2,336,780**	**430,516**	**598**	**8,564,953**

* Chemicals accounting for more than 70% of total relases and transfers of metals from the facility.

Rank	Total Releases (kg)	Treatment/ Destruction (kg)	Sewage/ POTW (kg)	Disposal/ Containment (kg)	Total Transfers (kg)	Total Releases and Transfers (kg)	Major Chemicals Reported (Primary Media/Transfers)*
1	1,254,893	0	10	3,578,500	3,578,510	4,833,403	Zinc and compounds (transfers to disposal)
2	481,240	0	0	3,814,700	3,814,700	4,295,940	Manganese and compounds (transfers to disposal)
3	17,410	3,054,700	0	0	3,054,700	3,072,110	Zinc and compounds (transfers to treatment)
4	15,909	0	1,677	2,539,176	2,540,853	2,556,762	Zinc/Manganese and compounds (transfers to disposal)
5	2,322,985	0	0	0	0	2,322,985	Zinc and compounds (land)
6	2,031,067	0	0	0	0	2,031,067	Zinc and compounds (land)
7	11,020	0	0	1,559,360	1,559,360	1,570,380	Zinc and compounds (transfers to disposal)
8	10,428	542	1,036	1,256,701	1,258,279	1,268,707	Zinc/Lead and compounds (transfers to disposal)
9	6,591	0	0	906,005	906,005	912,596	Chromium and compounds (transfers to disposal)
10	45,436	0	0	836,000	836,000	881,436	Manganese and compounds (transfers to disposal)
11	456	0	0	877,606	877,606	878,062	Zinc/Copper and compounds (transfers to disposal)
12	11,940	0	0	776,670	776,670	788,610	Zinc/Lead and compounds (transfers to disposal)
13	676,550	0	0	0	0	676,550	Lead/Copper/Zinc and compounds (air)
14	608,341	0	0	65,858	65,858	674,199	Zinc/Manganese and compounds (land)
15	1,840	481,110	0	0	481,110	482,950	Chromium/Nickel and compounds (transfers to treatment)
16	115,351	8,348	0	353,753	362,100	477,451	Chromium and compounds (transfer to disposal, land), Zinc and compounds (transfers to disposal)
17	457,180	0	0	0	0	457,180	Zinc/Lead and compounds (land)
18	53,530	0	0	383,900	383,900	437,430	Zinc/Manganese and compounds (transfers to disposal)
19	427,818	0	0	0	0	427,818	Copper/Nickel and compounds (air)
20	416,922	0	0	0	0	416,922	Zinc/Lead and compounds (air)
21	2,357	0	80	376,370	376,450	378,807	Lead and compounds (transfers to disposal)
22	331,280	0	0	0	0	331,280	Zinc/Manganese and compounds (land)
23	24,229	0	0	257,210	257,210	281,439	Lead and compounds (transfers to disposal)
24	275,000	0	0	0	0	275,000	Aluminum (land)
25	256,000	550	0	0	550	256,550	Chromium and compounds (land)
26	0	0	0	229,400	229,400	229,400	Lead and compounds (transfers to disposal)
27	214,600	0	0	0	0	214,600	Manganese and compounds (land, water)
28	0	207,367	2,095	0	209,461	209,461	Chromium/Nickel/Zinc and compounds (transfers to treatment)
29	333	184,210	0	16,944	201,154	201,487	Chromium/Manganese and compounds (transfers to treatment)
30	185,000	0	0	0	0	185,000	Aluminum (land)
31	400	90	1,060	153,410	154,560	154,960	Nickel/Chromium and compounds (transfers to disposal)
32	118,880	0	0	29,885	29,885	148,765	Zinc and compounds (air)
33	130,533	0	0	0	0	130,533	Vanadium (air)
34	0	0	0	121,540	121,540	121,540	Manganese and compounds (transfers to disposal)
35	1,178	0	3,118	110,863	113,981	115,159	Zinc and compounds (transfers to disposal)
36	33,811	0	0	80,834	80,834	114,645	Manganese and compounds (transfers to disposal)
37	0	0	0	111,156	111,156	111,156	Lead and compounds (transfers to disposal)
38	287	0	0	110,477	110,477	110,764	Lead and compounds (transfers to disposal)
39	0	0	0	105,000	105,000	105,000	Chromium and compounds (transfers to disposal)
40	104,466	0	0	0	0	104,466	Nickel and compounds (air)
41	10,600	0	0	76,000	76,000	86,600	Aluminum/Manganese and compounds (transfers to disposal)
42	5,440	0	11,983	63,278	75,261	80,701	Arsenic/Selenium/Copper and compounds (transfers to disposal)
43	79,116	0	0	43	43	79,159	Vanadium (air)
44	0	0	52	74,748	74,800	74,800	Zinc and compounds (transfers to disposal)
45	31,300	0	0	38,600	38,600	69,900	Manganese and compounds (transfers to disposal, water)
46	37,720	0	0	29,740	29,740	67,460	Zinc and compounds (water, transfers to disposal), Aluminum (transfers to disposal)
47	0	0	0	66,000	66,000	66,000	Aluminum oxide (transfers to disposal)
48	65,743	0	0	0	0	65,743	Manganese and compounds (land)
49	12,900	0	0	52,000	52,000	64,900	Manganese and compounds (transfers to disposal)
50	1,433	0	0	60,877	60,877	62,310	Manganese and compounds (transfers to disposal)
	10,889,513	**3,936,917**	**21,111**	**19,112,604**	**23,070,630**	**33,960,143**	
	95.7	**88.9**	**39.8**	**91.6**	**91.1**	**92.5**	
	11,374,194	**4,426,190**	**53,037**	**20,856,002**	**25,335,229**	**36,709,423**	

Table 5–37

M 1996

Top 50 TRI Facilities with Largest Total Releases and Transfers of Metals and their Compounds

Rank	Facility	City, State	US SIC Code	Number of Forms	Total Air Emissions (kg)	Surface Water Discharges (kg)	Underground Injection (kg)	On-site Land Releases (kg)
1	ASARCO Inc.	East Helena, MT	33	9	45,844	927	0	20,113,797
2	Cyprus Miami Mining, Cyprus Amax Minerals Co.	Claypool, AZ	33	11	21,941	113	0	11,298,685
3	Zinc Corp. of America, Horsehead Industries Inc.	Monaca, PA	33	9	219,985	272	0	0
4	ASARCO Inc., Ray Complex/Hayden Smelter	Hayden, AZ	33	8	484,619	0	0	4,555,926
5	Nucor Steel, Nucor Corp.	Crawfordsville, IN	33	6	959	26	0	11
6	Northwestern Steel & Wire Co.	Sterling, IL	33	4	47,510	1,224	0	6,496,599
7	National Steel Corp., Great Lakes Div.	Ecorse, MI	33	4	53,904	766	0	0
8	General Motors Corp., Powertrain Defiance	Defiance, OH	33	6	35,786	734	0	6,006,304
9	Rouge Steel Co.	Dearborn, MI	33	7	23,356	2,630	0	0
10	Elkem Metals Co.	Marietta, OH	33	5	218,149	326,984	0	4,763,719
11	American Chrome & Chemicals, Harrisons & Crossfield	Corpus Christi, TX	28	1	2,063	113	0	5,124,717
12	Kennecott Utah Copper, Kennecott Holdings Corp.	Magna, UT	33	8	64,265	1,927	0	4,121,891
13	Phelps Dodge Hidalgo Inc., Phelps Dodge Corp.	Playas, NM	33	1	117,531	0	0	4,261,163
14	Occidental Chemical Corp., Occidental Petroleum Corp.	Castle Hayne, NC	28	1	2,967	15	0	4,081,769
15	ASARCO Inc., Glover Plant	Annapolis, MO	33	6	158,230	35	0	3,871,963
16	Regal Ware Inc.	Kewaskum, WI	34	6	472	0	0	0
17	Doe Run Co., Herculaneum Smelter, Renco Group Inc.	Herculaneum, MO	33	9	106,342	149	0	3,467,229
18	Ameristeel Corp., Jacksonville Mill Div.	Baldwin, FL	33	6	8,663	0	0	0
19	Chino Mines Co.	Hurley, NM	33	1	18,380	0	0	3,457,663
20	Cerro Wire & Cable Co. Inc.	Hartselle, AL	33	3	120	7	0	0
21	USS Mon Valley Works Edgar Thomson Plant, USX Corp.	Braddock, PA	33	5	4,732	971	0	0
22	Keystone Steel & Wire Co., Keystone Consolidated Industries	Peoria, IL	33	3	597,497	542	0	165,402
23	U.S. Steel Gary Works, USX Corp.	Gary, IN	33	12	131,202	7,900	0	2,599,909
24	Granite City Steel, National Steel Corp.	Granite City, IL	33	6	21,822	5,397	0	2,592,722
25	FMC Corp.	Pocatello, ID	28	9	2,139	351	0	2,586,124
26	BHP Copper Metals Co., BHP Copper Co.	San Manuel, AZ	33	5	1,787,997	0	0	774,034
27	Kerr-McGee Chemical Corp. Electrolytic Plant, Kerr-McGee Corp	Hamilton, MS	33	3	3,583	11,211	0	2,335,782
28	Nucor-Yamato Steel Co., Nucor Corp.	Blytheville, AR	33	6	13,870	0	0	0
29	Steel Dynamics Inc.	Butler, IN	33	4	2,415	0	0	0
30	Oregon Steel Mills Inc.	Portland, OR	33	6	3,461	108	0	0
31	Nucor Steel, Nucor Corp.	Plymouth, UT	33	7	5,388	0	0	4,838
32	USS Fairfield Works, USX Corp.	Fairfield, AL	33	8	6,323	2,681	0	1,859,434
33	Nucor Steel, Nucor Corp.	Darlington, SC	33	7	49,219	342	0	2,354
34	Chemetals Inc., Comilog	New Johnsonville, TN	28	1	38,983	759	0	1,645,950
35	Ameristeel Corp.	Jackson, TN	33	7	11,625	1,014	0	0
36	Ameristeel Corp.	Charlotte, NC	33	6	19,637	0	0	0
37	ASARCO Inc.	Omaha, NE	33	5	19,665	1,842	0	1,136
38	Louisiana Pigment Co. L.P., Kronos Louisiana Inc.	Westlake, LA	28	2	375	110	0	1,269,841
39	SCM Chemicals Americas Plant II, SCM Chemicals Inc.	Ashtabula, OH	28	2	10	68,481	0	0
40	Quemetco Inc., RSR Corp.	Indianapolis, IN	33	6	2,197	0	0	0
41	General Battery Corp., Exide Corp.	Reading, PA	33	6	954	1,306	0	0
42	Quemetco Inc., RSR Corp.	City of Industry, CA	33	5	989	12	0	0
43	Southwire Co.	Carrollton, GA	Mult.	27	16,088	453	0	0
44	Eveready Battery Co. Inc., Ralston Purina Co.	Marietta, OH	28	1	4,898	181	0	0
45	American Insulated Wire, Leviton Mfg. Co. Inc.	Attleboro, MA	33	5	874	0	0	0
46	Koppel Steel Corp.	Koppel, PA	32	7	4,483	58	0	0
47	General Motors Corp., GMTG Saginaw Metal Casting	Saginaw, MI	33	6	19,257	1	0	999,955
48	Madison Ind. Inc.	Old Bridge, NJ	28	3	55	0	0	0
49	Kerr-McGee Chemical Corp.	Henderson, NV	28	2	6,259	0	0	949,116
50	Glenbrook Nickel Co., Cominco American Inc.	Riddle, OR	33	1	17,061	7	0	905,522
	Subtotal			**284**	**4,424,145**	**439,649**	**0**	**100,313,555**
	% of the Following Totals			**1.5**	**33.4**	**22.9**	**0.0**	**85.6**
	Total of All Matched TRI Metals			**19,573**	**13,240,677**	**1,920,449**	**417,329**	**117,151,595**

* Chemicals accounting for more than 70% of total releases and transfers of metals from the facility.

➤ Three TRI facilities reported in error. Gunderson Inc., Portland, OR, reported 2.8 million kg of air emissions of manganese and Tennessee Aluminum Processor Inc., Maury, PA, reported 720,000 kg of on-site releases to land and 165,000 kg of transfers to disposal of aluminum and Thomson Consumer Electronics, Dunmore, PA, reported 3.1 million kg of transfers to disposal of lead compounds. They have been omitted from this table.

Rank	Total Releases (kg)	Treatment/ Destruction (kg)	Sewage/ POTW (kg)	Disposal/ Containment (kg)	Total Transfers (kg)	Total Releases and Transfers (kg)	Major Chemicals Reported (Primary Media/Transfers)*
1	20,160,568	0	17	0	17	20,160,585	Zinc and compounds (land)
2	11,320,739	0	0	0	0	11,320,739	Copper/Zinc and compounds (land)
3	220,257	48,556	0	10,424,925	10,473,482	10,693,738	Zinc/Manganese and compounds (transfers to disposal)
4	5,040,544	3,033,400	129	0	3,033,529	8,074,073	Lead and compounds (transfers to treatment), Copper/Zinc and compounds (land)
5	996	392	0	7,659,029	7,659,422	7,660,418	Zinc and compounds (transfers to disposal)
6	6,545,333	65,170	0	0	65,170	6,610,503	Zinc/Manganese and compounds (land)
7	54,670	46,776	425	6,299,280	6,346,480	6,401,151	Zinc and compounds (transfers to disposal)
8	6,042,824	0	410	0	410	6,043,234	Zinc and compounds (land)
9	25,986	0	0	5,933,560	5,933,560	5,959,546	Zinc and compounds (transfers to disposal)
10	5,308,852	0	0	43,537	43,537	5,352,390	Manganese and compounds (land)
11	5,126,893	24,036	0	3,129	27,166	5,154,059	Chromium and compounds (land)
12	4,188,084	0	0	347,302	347,302	4,535,385	Copper/Zinc and compounds (land)
13	4,378,694	0	0	0	0	4,378,694	Copper and compounds (land)
14	4,084,751	4,535	0	0	4,535	4,089,286	Chromium and compounds (land)
15	4,030,228	0	0	0	0	4,030,228	Zinc/Lead and compounds (land)
16	472	0	0	3,646,259	3,646,259	3,646,730	Aluminum oxide (transfers to disposal)
17	3,573,720	0	452	0	452	3,574,172	Zinc and compounds (land)
18	8,663	1,756,102	0	1,756,102	3,512,205	3,520,868	Zinc and compounds (transfers to treatment, disposal)
19	3,476,044	0	0	0	0	3,476,044	Copper and compounds (land)
20	127	0	0	3,439,996	3,439,996	3,440,123	Copper and compounds (transfers to disposal)
21	5,703	0	0	3,260,882	3,260,882	3,266,585	Zinc and compounds (transfers to disposal)
22	763,441	2,351,084	0	0	2,351,084	3,114,526	Zinc and compounds (transfers to treatment)
23	2,739,011	0	0	45,387	45,387	2,784,398	Zinc/Manganese and compounds (land)
24	2,619,941	544	0	0	544	2,620,484	Zinc and compounds (land)
25	2,588,615	0	3	793	795	2,589,410	Zinc and compounds (land)
26	2,562,031	0	0	816	816	2,562,847	Copper and compounds (air)
27	2,350,576	0	0	0	0	2,350,576	Manganese and compounds (land)
28	13,870	2,096,133	0	1,172	2,097,305	2,111,176	Zinc and compounds (transfers to treatment)
29	2,415	0	2	2,055,950	2,055,952	2,058,367	Zinc and compounds (transfers to disposal)
30	3,569	1,932,004	0	96	1,932,100	1,935,668	Zinc and compounds (transfers to treatment)
31	10,226	1,893,347	0	1	1,893,348	1,903,574	Zinc and compounds (transfers to treatment)
32	1,868,437	0	0	0	0	1,868,437	Zinc and compounds (land)
33	51,915	0	0	1,645,528	1,645,528	1,697,443	Zinc and compounds (transfers to disposal)
34	1,685,692	0	0	0	0	1,685,692	Manganese and compounds (land)
35	12,639	1,601,938	0	0	1,601,938	1,614,576	Zinc and compounds (transfers to treatment)
36	19,637	1,430,806	0	0	1,430,806	1,450,444	Zinc and compounds (transfers to treatment)
37	22,643	0	26	1,329,875	1,329,901	1,352,544	Zinc/Lead and compounds (transfers to disposal)
38	1,270,326	68	0	169	237	1,270,563	Manganese and compounds (land)
39	68,491	0	0	1,170,941	1,170,941	1,239,431	Manganese and compounds (transfers to disposal)
40	2,197	0	357	1,234,014	1,234,371	1,236,567	Lead/Antimony and compounds (transfers to disposal)
41	2,260	852,044	0	368,927	1,220,971	1,223,231	Lead and compounds (transfers to treatment, disposal)
42	1,001	0	254	1,196,372	1,196,626	1,197,627	Lead/Antimony and compounds (transfers to disposal)
43	16,541	1,083,903	27	96,446	1,180,376	1,196,917	Zinc/Lead and compounds (transfers to treatment)
44	5,079	1,043,084	0	104,308	1,147,392	1,152,472	Manganese and compounds (transfers to treatment)
45	874	0	0	1,082,450	1,082,450	1,083,324	Copper and compounds (transfers to disposal)
46	4,541	1	0	1,047,585	1,047,586	1,052,127	Zinc and compounds (transfers to disposal)
47	1,019,212	0	426	0	426	1,019,639	Zinc/Manganese and compounds (land)
48	55	995,383	54	0	995,438	995,493	Zinc and compounds (transfers to treatment)
49	955,374	1,288	0	0	1,288	956,662	Manganese and compounds (land)
50	922,590	0	0	0	0	922,590	Nickel and compounds (land)
	105,177,349	**20,260,596**	**2,583**	**54,194,831**	**74,458,011**	**179,635,360**	
	79.2	**56.8**	**0.3**	**49.0**	**50.6**	**64.2**	
	132,730,050	**35,662,037**	**948,205**	**110,532,930**	**147,143,172**	**279,873,222**	

5.5 Industry Distribution

Releases by Industry

The same three industries ranked at the top for total releases in both NPRI and TRI: chemical manufacturing, primary metals, and paper products. The chemical industry reported one-quarter of all NPRI releases in the matched data set and one-third of TRI releases (**Tables 5–38** and **5–39**, p. 166).

In NPRI, the chemical industry ranked first for emissions to air and injection to underground wells. Primary metal industries reported NPRI's largest on-site releases to land. The paper products sector reported the largest discharges to surface waters and the second largest emissions to air.

TRI's chemical manufacturing industry ranked first for air emissions, surface water discharges, and underground injection. The primary metal industries, ranking second, reported TRI's largest on-site land releases. TRI's paper products sector reported the second largest air emissions, ranking third for total releases.

Transfers by Industry

The pattern of off-site transfers differed considerably in NPRI and TRI. The primary metal industries reported more than half of NPRI's transfers. The chemical industry ranked second, reporting 28 percent of NPRI's total. In contrast, the chemical industry led TRI reporting of transfers, closely followed by primary metals, each accounting for one-third of the TRI total. The paper products industry ranked third in both PRTRs, with a much smaller share of the total (5 percent in NPRI and 7 percent in TRI—see **Tables 5–40**, p. 167 and **5–41**, p. 168).

In both PRTRs, the chemical industry reported the largest transfers to treatment/destruction and to sewage/POTWs, while the primary metals producers reported sending the largest amounts to disposal/containment. In NPRI, the primary metal industries ranked first for total transfers because its transfers to disposal/containment outweighed the chemical industry's transfers in the other categories.

Releases and Transfers by Industry

The same three industries ranked at the top for total releases and transfers in NPRI and in TRI, but not in the same rank order. Because of its large transfers, primary metals ranked first in NPRI, reporting one-third of all NPRI releases and transfers in the matched data set. Chemicals ranked second, and paper products third. In TRI, the chemical manufacturing industry reported the largest releases and transfers (one-third of the TRI total), followed by primary metals and paper products. The chemical industry submitted the most forms (more than twice as many as any other industrial sector) in both PRTRs (**Tables 5–42**, p. 169 and **5–43**, p. 170).

These three industries accounted for 75 percent of the releases and transfers reported to NPRI and 69 percent of those in TRI (**Figure 5–17**).

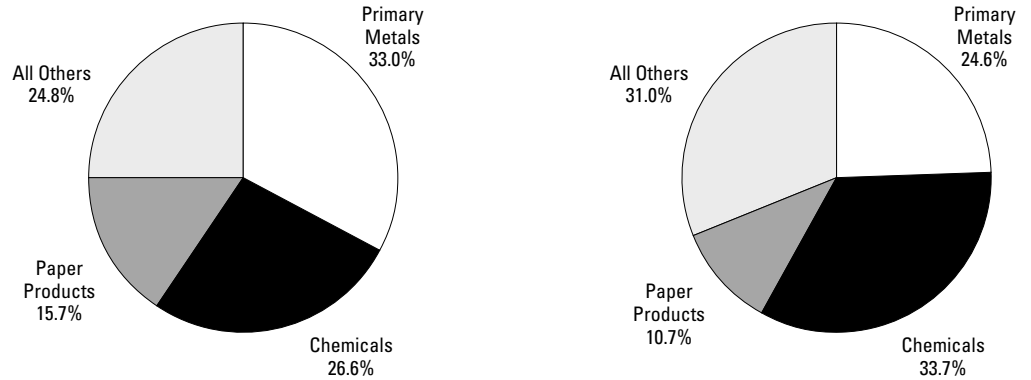
In TRI, the multiple codes category ranked fourth for total releases and transfers (**Table 5–43**, p. 170). This category consists of reporting forms that supply more than one SIC code to describe the facility's operations. The multiple-codes category exists only in TRI reporting; NPRI facilities report just one SIC code each.

Top Facilities for Releases and Transfers

Releases. The industrial distribution of the top 50 facilities for total releases differed strikingly between NPRI and TRI. In NPRI, the largest number of facilities (14 facilities) reported in the paper products industry, while 12 facilities reported in chemical manufacturing and another 12 in primary metals. More than half (27 facilities) of the top TRI facilities reported in the chemical industry, 17 reported in primary metals, but only one in the paper products industry (see **Tables 5–2**, pp. 104–5 and **5–3**, pp. 106–7, above).

Figure 5–17
M 1996

Industries with Largest Total Releases and Transfers, NPRI and TRI



Releases and Transfers. The same industries were represented among the top NPRI facilities for total releases and transfers as for total releases, but their distribution differed. Because of the larger role of off-site transfers for disposal/containment in the primary metal industries, a larger number (18 facilities) of primary metals facilities ranked among the top 50. Fourteen of the top NPRI facilities reported in the chemical industry, and nine in paper products. In TRI, 23 of the facilities with the largest total releases and transfers reported in chemical manufacturing, 22 in primary metals production, and three in paper products manufacturing. As in NPRI, off-site transfers by primary metals facilities placed more facilities in this industry among the top 50 for total releases and transfers than in the top 50 for total releases only (see **Tables 5–4**, pp. 108–9 and **5–5**, po. 110–11, above).

[Text continues on p. 171.]

Table 5–38
M 1996

NPRI Releases by Industry (US SIC Code)

Rank	US SIC Code	Industry	Total Air Emissions (kg)	Surface Water Discharges (kg)	Underground Injection (kg)	On-site Land Releases (kg)	Total Releases (kg)	% of Total
1	28	Chemicals	15,127,066	1,096,143	4,743,637	234,604	21,268,072	25.7
2	33	Primary Metal Industries	10,340,809	790,847	0	8,112,326	19,263,557	23.3
3	26	Paper Products	14,382,612	2,886,534	0	163,051	17,434,128	21.1
4	37	Transportation Equipment	6,378,752	263	0	2,613	6,388,155	7.7
5	30	Rubber and Plastics Products	5,932,823	621	0	14,558	5,955,007	7.2
6	29	Petroleum and Coal Products	4,500,342	23,476	68,733	108,338	4,703,762	5.7
7	34	Fabricated Metals Products	2,010,202	503	0	10,234	2,034,039	2.5
8	24	Lumber and Wood Products	1,714,361	19,370	0	150	1,734,425	2.1
9	32	Stone/Clay/Glass Products	901,789	9,456	0	5,080	917,982	1.1
10	27	Printing and Publishing	665,248	5,604	0	0	671,352	0.8
11	39	Misc. Manufacturing Industries	528,663	0	9	5,404	537,524	0.7
12	25	Furniture and Fixtures	474,565	0	0	0	475,075	0.6
13	35	Industrial Machinery	161,909	24	0	255,800	419,851	0.5
14	20	Food Products	57,308	292,100	0	19,842	369,250	0.4
15	22	Textile Mill Products	331,277	0	0	74	331,651	0.4
16	36	Electronic/Electrical Equipment	76,335	3,193	0	4,417	85,985	0.1
17	31	Leather Products	5,900	0	0	0	5,900	0.0
18	23	Apparel and Other Textile Products	740	0	0	0	740	0.0
19	38	Measurement/Photographic Instruments	5	0	0	0	5	0.0
		Total NPRI Releases	**63,590,706**	**5,128,134**	**4,812,379**	**8,936,491**	**82,596,460**	**100.0**

Table 5–39

M 1996

TRI Releases by Industry (US SIC Code)

Rank	US SIC Code	Industry	Total Air Emissions (kg)	Surface Water Discharges (kg)	Underground Injection (kg)	On-site Land Releases (kg)	Total Releases (kg)	% of Total
1	28	Chemicals	121,530,567	38,598,234	69,773,948	31,219,800	261,122,549	33.5
2	33	Primary Metal Industries	52,261,359	14,038,076	207,075	97,087,456	163,593,966	21.0
3	26	Paper Products	86,883,093	6,373,852	0	2,114,986	95,371,931	12.2
4	30	Rubber and Plastics Products	41,972,438	9,634	0	166,181	42,148,253	5.4
5		Multiple Codes 20-39*	34,472,473	4,597,117	231	2,536,176	41,605,997	5.3
6	37	Transportation Equipment	40,004,420	87,700	0	304,091	40,396,211	5.2
7	29	Petroleum and Coal Products	18,074,352	4,382,206	445,467	542,078	23,444,103	3.0
8	34	Fabricated Metals Products	21,761,990	144,701	259	324,378	22,231,328	2.8
9	25	Furniture and Fixtures	15,472,844	20	0	4,826	15,477,690	2.0
10	27	Printing and Publishing	12,074,024	639	0	6,190	12,080,853	1.5
11	24	Lumber and Wood Products	11,928,605	7,179	0	4,312	11,940,096	1.5
12	32	Stone/Clay/Glass Products	9,503,140	18,519	454	1,039,135	10,561,248	1.4
13	36	Electronic/Electrical Equipment	7,462,582	648,574	12	156,021	8,267,189	1.1
14	20	Food Products	2,514,306	3,878,593	118	1,247,408	7,640,425	1.0
15	22	Textile Mill Products	6,599,424	152,862	0	78,739	6,831,025	0.9
16	35	Industrial Machinery	6,712,298	5,014	0	56,662	6,773,974	0.9
17	38	Measurement/Photographic Instruments	4,900,644	564,214	0	1,148	5,466,006	0.7
18	39	Misc. Manufacturing Industries	3,877,758	893	0	9,016	3,887,667	0.5
19	23	Apparel and Other Textile Products	645,932	2,367	0	242	648,541	0.1
20	21	Tobacco Products	514,743	81,270	0	0	596,013	0.1
21	31	Leather Products	511,478	22,701	0	2,711	536,890	0.1
		Total TRI Releases	**499,678,471**	**73,614,363**	**70,427,564**	**136,901,554**	**780,621,952**	**100.0**

* Multiple SIC codes reported only in US data.

Table 5–40

M 1996

NPRI Transfers by Industry (US SIC Code)

Rank	US SIC Code	Industry	Treatment/ Destruction (kg)	Sewage/ POTWs (kg)	Disposal/ Containment (kg)	Total Transfers (kg)	% of Total
1	33	Primary Metal Industries	3,747,868	227,110	17,714,674	21,689,651	52.2
2	28	Chemicals	5,734,635	3,949,304	2,037,975	11,721,908	28.2
3	26	Paper Products	1,566,999	4,834	437,184	2,009,017	4.8
4	34	Fabricated Metals Products	601,953	129,947	1,030,736	1,762,634	4.2
5	30	Rubber and Plastics Products	583,896	34,717	492,584	1,111,195	2.7
6	37	Transportation Equipment	659,952	102,986	330,863	1,093,799	2.6
7	29	Petroleum and Coal Products	194,473	16,930	309,484	520,887	1.3
8	36	Electronic/Electrical Equipment	73,383	10,449	286,657	370,489	0.9
9	20	Food Products	26,774	343,261	380	370,415	0.9
10	32	Stone/Clay/Glass Products	53,257	22,133	167,757	243,147	0.6
11	39	Misc. Manufacturing Industries	36,832	98,213	67,102	202,147	0.5
12	27	Printing and Publishing	183,738	0	0	183,738	0.4
13	35	Industrial Machinery	52,932	6	120,812	173,750	0.4
14	24	Lumber and Wood Products	36,092	44	20,648	56,784	0.1
15	25	Furniture and Fixtures	9,327	0	179	9,506	0.0
16	31	Leather Products	4,300	3,300	0	7,600	0.0
17	22	Textile Mill Products	5,388	0	569	5,957	0.0
18	38	Measurement/Photographic Instruments	0	0	50	50	0.0
19	23	Apparel and Other Textile Products	0	0	0	0	0.0
		Total NPRI Transfers	**13,571,799**	**4,943,234**	**23,017,654**	**41,532,687**	**100.0**

Table 5–41
M 1996

TRI Transfers by Industry (US SIC Code)

Rank	US SIC Code	Industry	Treatment/ Destruction (kg)	Sewage/ POTWs (kg)	Disposal/ Containment (kg)	Total Transfers (kg)	% of Total
1	28	Chemicals	57,483,594	41,100,651	11,559,701	110,143,946	34.3
2	33	Primary Metal Industries	28,234,351	2,950,267	76,244,624	107,429,242	33.5
3	26	Paper Products	4,400,062	17,148,417	1,227,253	22,775,732	7.1
4		Multiple Codes 20-39*	5,767,650	5,090,165	4,248,580	15,106,395	4.7
5	34	Fabricated Metals Products	4,665,784	1,433,646	8,982,190	15,081,620	4.7
6	36	Electronic/Electrical Equipment	2,112,004	3,609,228	6,989,567	12,710,799	4.0
7	20	Food Products	360,941	7,533,367	172,571	8,066,879	2.5
8	30	Rubber and Plastics Products	1,326,548	770,999	4,451,392	6,548,939	2.0
9	37	Transportation Equipment	2,020,815	1,273,272	2,859,297	6,153,384	1.9
10	35	Industrial Machinery	454,667	1,362,132	2,114,036	3,930,835	1.2
11	29	Petroleum and Coal Products	894,235	1,941,209	1,077,778	3,913,222	1.2
12	32	Stone/Clay/Glass Products	1,172,201	302,218	2,412,176	3,886,595	1.2
13	38	Measurement/Photographic Instruments	1,064,029	403,328	282,061	1,749,418	0.5
14	22	Textile Mill Products	231,845	697,111	187,011	1,115,967	0.3
15	31	Leather Products	3,664	177,433	662,864	843,961	0.3
16	39	Misc. Manufacturing Industries	215,569	224,518	354,480	794,567	0.2
17	25	Furniture and Fixtures	270,920	41,434	52,563	364,917	0.1
18	27	Printing and Publishing	152,481	69,745	37,310	259,536	0.1
19	24	Lumber and Wood Products	69,488	1,408	103,665	174,561	0.1
20	23	Apparel and Other Textile Products	243	116	28,538	28,897	0.0
21	21	Tobacco Products	181	0	0	181	0.0
		Total TRI Transfers	**110,901,271**	**86,130,663**	**124,047,657**	**321,079,591**	**100.0**

* Multiple SIC codes reported only in US data.

Table 5–42

M 1996

NPRI Releases and Transfers by Industry (US SIC Code)

Rank	US SIC Code	Industry	Number of Forms	Total Releases (kg)	Total Transfers (kg)	Total Releases and Transfers (kg)	% of Total
1	33	Primary Metal Industries	589	19,263,557	21,689,651	40,953,208	33.0
2	28	Chemicals	1,367	21,268,072	11,721,908	32,989,980	26.6
3	26	Paper Products	317	17,434,128	2,009,017	19,443,145	15.7
4	37	Transportation Equipment	354	6,388,155	1,093,799	7,481,954	6.0
5	30	Rubber and Plastics Products	268	5,955,007	1,111,195	7,066,202	5.7
6	29	Petroleum and Coal Products	333	4,703,762	520,887	5,224,649	4.2
7	34	Fabricated Metals Products	384	2,034,039	1,762,634	3,796,673	3.1
8	24	Lumber and Wood Products	143	1,734,425	56,784	1,791,209	1.4
9	32	Stone/Clay/Glass Products	93	917,982	243,147	1,161,129	0.9
10	27	Printing and Publishing	23	671,352	183,738	855,090	0.7
11	39	Misc. Manufacturing Industries	107	537,524	202,147	739,671	0.6
12	20	Food Products	116	369,250	370,415	739,665	0.6
13	35	Industrial Machinery	64	419,851	173,750	593,601	0.5
14	25	Furniture and Fixtures	25	475,075	9,506	484,581	0.4
15	36	Electronic/Electrical Equipment	95	85,985	370,489	456,474	0.4
16	22	Textile Mill Products	16	331,651	5,957	337,608	0.3
17	31	Leather Products	2	5,900	7,600	13,500	0.0
18	23	Apparel and Other Textile Products	1	740	0	740	0.0
19	38	Measurement/Photographic Instruments	1	5	50	55	0.0
		Total NPRI Releases and Transfers	**4,298**	**82,596,460**	**41,532,687**	**124,129,147**	**100.0**

Table 5–43

M 1996

TRI Releases and Transfers by Industry (US SIC Code)

Rank	US SIC Code	Industry	Number of Forms	Total Releases (kg)	Total Transfers (kg)	Total Releases and Transfers (kg)	% of Total
1	28	Chemicals	16,227	261,122,549	110,143,946	371,266,495	33.7
2	33	Primary Metal Industries	5,916	163,593,966	107,429,242	271,023,208	24.6
3	26	Paper Products	1,978	95,371,931	22,775,732	118,147,663	10.7
4		Multiple Codes 20-39*	3,816	41,605,997	15,106,395	56,712,392	5.1
5	30	Rubber and Plastics Products	3,050	42,148,253	6,548,939	48,697,192	4.4
6	37	Transportation Equipment	3,708	40,396,211	6,153,384	46,549,595	4.2
7	34	Fabricated Metal Products	6,570	22,231,328	15,081,620	37,312,948	3.4
8	29	Petroleum and Coal Products	2,724	23,444,103	3,913,222	27,357,325	2.5
9	36	Electronic/Electrical Equipment	2,543	8,267,189	12,710,799	20,977,988	1.9
10	25	Furniture and Fixtures	1,152	15,477,690	364,917	15,842,607	1.4
11	20	Food Products	2,584	7,640,425	8,066,879	15,707,304	1.4
12	32	Stone/Clay/Glass Products	1,420	10,561,248	3,886,595	14,447,843	1.3
13	27	Printing and Publishing	370	12,080,853	259,536	12,340,389	1.1
14	24	Lumber and Wood Products	1,595	11,940,096	174,561	12,114,657	1.1
15	35	Industrial Machinery	2,411	6,773,974	3,930,835	10,704,809	1.0
16	22	Textiles Mill Products	486	6,831,025	1,115,967	7,946,992	0.7
17	38	Measurement/Photographic Instruments	563	5,466,006	1,749,418	7,215,424	0.7
18	39	Misc. Manufacturing Industries	635	3,887,667	794,567	4,682,234	0.4
19	31	Leather Products	125	536,890	843,961	1,380,851	0.1
20	23	Apparel and Other Textile Products	36	648,541	28,897	677,438	0.1
21	21	Tobacco Products	18	596,013	181	596,194	0.1
		Total TRI Releases and Transfers	**57,927**	**780,621,952**	**321,079,591**	**1,101,701,543**	**100.0**

* Multiple SIC codes reported only in US data.

5.6 NPRI and TRI Averages for Releases and Transfers

On average, Canadian and US facilities reported on three chemical substances or groups each in 1996. NPRI facilities submitted an average of 3.2 forms, while TRI facilities submitted 3.0 forms. NPRI facilities reported larger total releases and transfers per facility than their TRI counterparts—more than one and one-half times larger. The difference was somewhat greater for transfers (**Table 5–44**).

Averages per reporting form compare reporting patterns on a chemical rather than a facility basis. This measure compensates for the small difference between NPRI and TRI in the average number of forms per facility. In 1996, NPRI facilities averaged 28,881 kg of releases and transfers per reporting form, while TRI facilities averaged 19,019 kg per reporting form. Thus, NPRI facilities reported total releases and transfers per form that were one and one-half times larger than the average for TRI facilities (**Table 5–45**).

Differences arose specifically in reporting of air emissions (1.7 times larger per form in NPRI), transfers to treatment/destruction (1.6 times larger), and transfers to disposal/containment (2.5 times larger). For the other release categories, surface water discharges, underground injection and on-site land releases, as well as transfers to sewage/POTWs, NPRI facilities reported slightly smaller amounts, on average, than TRI facilities.

Some PRTR information such as industrial mix or activities and uses of the chemicals can be examined to explore this difference between NPRI and TRI. Other factors that may influence facility averages—such as regulatory requirements—extend beyond information supplied in NPRI and TRI and cannot be examined using PRTR data.

Table 5–44
M 1996

Average Releases and Transfers per Facility, NPRI and TRI

	NPRI Number	TRI Number
Total Facilities	1,344	19,190
Total Forms	4,298	57,927
Average Forms per Facility	3.2	3.0
	kg	**kg**
Average Releases per Facility	61,456	40,679
Average Transfers per Facility	30,902	16,732
Average Releases and Transfers per Facility	92,358	57,410

Table 5–45
M 1996

Average Releases and Transfers per Form, NPRI and TRI

	NPRI Number		TRI Number		
Total Forms	4,298		57,927		
	kg	**kg/form**	**kg**	**kg/form**	**Ratio of Average per Form (NPRI/TRI)**
Total Air Emissions	63,590,706	14,795	499,678,471	8,626	1.7
Surface Water Discharges	5,128,134	1,193	73,614,363	1,271	0.9
Underground Injection	4,812,379	1,120	70,427,564	1,216	0.9
On-site Land Releases	8,936,491	2,079	136,901,554	2,363	0.9
Matched Releases	**82,596,460**	**19,217**	**780,621,952**	**13,476**	**1.4**
Treatment/Destruction	13,571,799	3,158	110,901,271	1,915	1.6
Sewage/POTWs	4,943,234	1,150	86,130,663	1,487	0.8
Disposal/Containment	23,017,654	5,355	124,047,657	2,141	2.5
Matched Transfers	**41,532,687**	**9,663**	**321,079,591**	**5,543**	**1.7**
Matched Releases and Transfers	**124,129,147**	**28,881**	**1,101,701,543**	**19,019**	**1.5**

5.6.1 Reporting Thresholds

Similar threshold amounts trigger facility reporting in both Canada and the United States. TRI, however, applies lower reporting thresholds for substances that are "otherwise used" (rather than manufactured or processed) and for substances identified as carcinogens by the US Occupational Safety and Health Administration (OSHA). While the reporting threshold for manufacturing or processing a chemical is 25,000 lbs (11,340 kg), TRI facilities must report if they "otherwise use" more than 10,000 lbs (4,536 kg). For OSHA-designated carcinogens, the TRI *de minimus* level for reporting is a concentration of 0.1 percent, rather than the 1.0 percent level that applies to all other TRI chemicals and to all NPRI chemicals. Eliminating from the matched data set all forms that report only in the "otherwise used" category and those that report OSHA carcinogens controls for these differences.

After adjusting for threshold differences, NPRI forms still averaged nearly one and one-half times (a ratio of 1.4) the total releases and transfers of those in TRI. These adjustments account for only about one-sixth of the difference between NPRI and TRI averages (**Table 5–46**, p. 173).

5.6.2 Chemical Use/Activity

NPRI and TRI facilities indicate whether they manufacture, process, or otherwise use the chemicals they report. They may report one or more of these activities for each substance. Differences in how facilities in Canada and the United States use these chemicals could account for differences in their average amounts of releases and transfers. In all but two cases, however, NPRI forms contained greater average total releases and transfers than those in TRI (**Table 5–47**, p. 173 and **Figure 5–18**).

The greatest difference appeared in forms reporting "other uses" only, with an average 1.7 times higher in NPRI than in TRI. This might be expected since the TRI threshold is lower for "other uses." Only in combinations of manufacturing with processing or with "other uses" were NPRI averages lower than in TRI.

Figure 5–18
M 1996

Total Releases and Transfers per Form by Use, NPRI and TRI

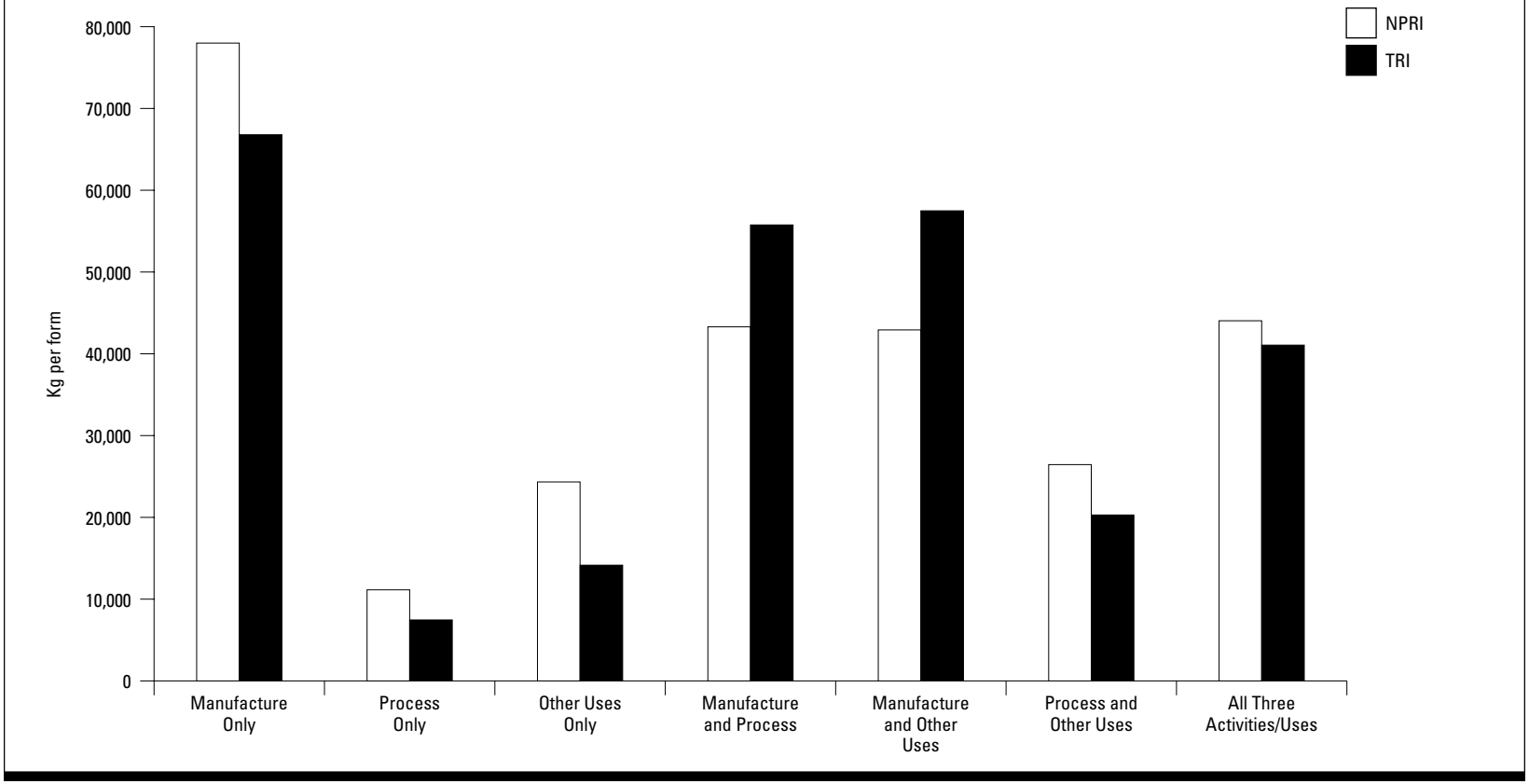


Table 5–46
M 1996

Matching NPRI and TRI Forms on Thresholds

	Number of Forms	Total Releases (kg)	Total Transfers (kg)	Total Releases and Transfers (kg)	Average per Form (kg)
NPRI Matched Chemicals/Industries	4,298	82,596,460	41,532,687	124,129,147	28,881
Minus "Other Uses" Only	863	16,367,602	4,627,977	20,995,579	24,329
Minus *de minimus* Chemicals	1,085	11,052,610	6,903,439	17,956,049	16,549
Plus *de minimus* and "Other Uses" Only Forms*	175	3,441,300	1,384,020	4,825,320	27,573
NPRI Matched Thresholds	**2,525**	**58,617,548**	**31,385,291**	**90,002,839**	**35,645**
TRI Matched Chemicals/Industries	57,927	780,621,952	321,079,591	1,101,701,543	19,019
Minus "Other Uses" Only Forms	15,814	166,407,594	57,504,041	223,911,635	14,159
Minus *de minimus* Chemicals Forms	15,679	115,380,897	55,528,201	170,909,098	10,901
Plus *de minimus* and "Other Uses" Only Forms*	2,490	30,655,427	11,307,325	41,962,752	16,853
TRI Matched Thresholds	**28,924**	**529,488,888**	**219,354,674**	**748,843,562**	**25,890**

* To avoid double subtraction, since these forms are in both of the first two categories.

Table 5–47
M 1996

NPRI and TRI Average Total Releases and Transfers per Form, by Activity/Use Type

	NPRI			TRI*			
Type of Activity/Use	Number of Forms	Forms as % of Total	kg/form	Number of Forms	Forms as % of Total	kg/form	Ratio of Average Total Releases and Transfers per Form (NPRI/TRI)
Manufacturing Only	595	13.8	77,997	4,224	8.1	66,799	1.2
Processing Only	1,920	44.7	11,139	22,184	42.3	7,460	1.5
Other Uses Only	863	20.1	24,329	15,814	30.2	14,159	1.7
Manufacturing and Processing	463	10.8	43,296	4,117	7.9	55,758	0.8
Manufacturing and Other Uses	76	1.8	42,920	1,429	2.7	57,486	0.7
Processing and Other Uses	270	6.3	26,450	3,570	6.8	20,291	1.3
All Three Activities/Uses	111	2.6	44,040	1,102	2.1	41,064	1.1
Total	**4,298**	**100.0**	**28,881**	**52,440**	**100.0**	**20,994**	**1.4**

* Ten percent of TRI forms did not have activity/use designation. They have been omitted from this analysis.

5.6.3 Facilities with Very Large or Very Small Releases

A potential explanation of the different averages could lie in a predominance of facilities with large or small releases and transfers in NPRI or TRI. In NPRI, 1.6 percontributed 43 percent of NPRI's releases and transfers, while in TRI, facilities in this category contributed 49 percent of the total. Two thirds (68 percent) of TRI's facilities reported less than 10,000 kg each. In NPRI, this group represented 58 percent of all facilities. These facilities with very small releases reported two percent of TRI's total releases and transfers and just one percent of NPRI's (**Figure 5–19** and **Table 5–48**, p. 176).

In all of the upper ranges of total release and transfer values, the NPRI facilities represented a greater percentage of the NPRI total than did the corresponding TRI facilities. Thus, there were relatively more facilities in NPRI reporting the largest total releases and transfers than there were in TRI, and more facilities in TRI reporting the smallest total releases and transfers than in NPRI.

5.6.4 Industrial Mix

Differences in the industrial mix of facilities reporting to the two PRTRs—within the matched set of industries—might account for some of the greater releases and transfers per facility in Canada. Primary metals producers, for example, submitted 14 percent of the forms in NPRI but only 10 percent of those in TRI. At the same time, chemical manufacturers submitted 32 percent of the forms in NPRI but only 28 percent of those to TRI (see **Tables 5–42**, p. 169 and **5–43**, p. 170, above). Had one or both of these industries tended to produce greater releases and transfers—in both countries—than other industries, then the relative prevalence of that industry in Canada would have contributed to NPRI's larger average of releases and transfers per form. In fact, this is not the case.

Major Industry Groups (Two-Digit SIC Codes)

In 14 industries, NPRI data indicate higher releases and transfers per form than TRI reporting by the same industries. Thus, differences in average releases and transfers between NPRI and TRI within industries outweigh the influence of the role of each industry within NPRI or TRI. In the primary metal industries, NPRI facilities reported releases and transfers averaging 69,530 kg per form, while TRI facilities averaged 45,812 kg per form. In the chemical industry, the difference between NPRI and TRI reporters is small, but the importance of this industry in both countries' PRTRs makes that small difference significant (**Table 5–49**, p. 178 and **Figure 5–20**).

Industrial Activities within Industry Groups (Three-Digit SIC Codes)

Differences in the Canadian and US mix of specific industrial activities within the major industrial groups also do not account for the larger NPRI averages for releases and transfers.

In the primary metal industries, NPRI releases and transfers per form were substantially higher for blast furnaces, iron and steel foundries and miscellaneous primary metal products. These industries accounted for nearly half of both NPRI and TRI forms in SIC code 33 in 1996. These more than offset the very large average in TRI for primary nonferrous metal production, along with higher TRI averages for other three-digit activities in the primary metals industry (**Table 5–50**, p. 179).

For chemical manufacturing, Canadian facilities reported higher releases and transfers per form in all industrial activities except the production of soap, cleaners and toilet goods and miscellaneous chemical products, which represented the smaller segments of chemical industry reporting in both countries (**Table 5–51**, p. 179).

In the paper products industry, Canadian pulp mills reported smaller releases and transfers, on average, than US pulp mills. However, pulpmaking constituted a larger portion of the paper products industry in Canada than in the United States. Substantial differences occurred in the averages for NPRI and TRI manufacturers of paperboard boxes and miscellaneous converted paper products. Even though these two activities represented relatively small portions of paper products manufacturing in both countries, the differences reduced the overall average for TRI in this industry (**Table 5–52**, p. 179).

In all three industries—chemicals, primary metals, and paper products—the larger NPRI averages occurred despite the influence in TRI of high average releases and transfers by the multiple-codes groups. These forms reported more than one SIC code within the major industry group (for example, more than one SIC code within SIC 33 for primary metals). Forms with multiple codes do not appear in NPRI because NPRI facilities report only one SIC code representing their primary industrial activity.

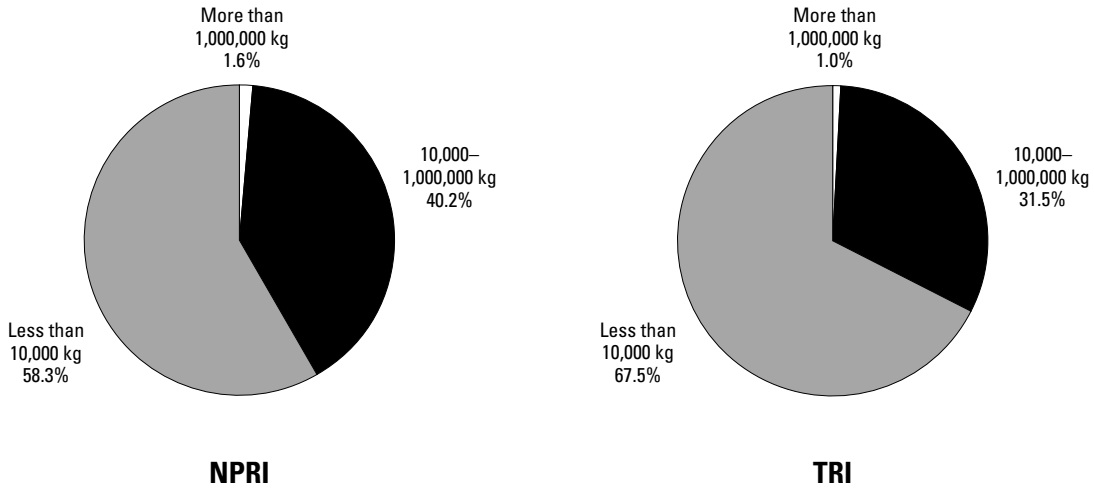
In both the chemical and paper industries, those facilities reporting multiple-codes to TRI submitted the most forms and contributed the largest total releases and transfers.

[Text continues on p. 180.]

Figure 5–19
M 1996

Distribution of NPRI and TRI Facilities and Total Releases and Transfers

Distribution of Facilities by Amount of Total Releases and Transfers



Distribution of Total Releases and Transfers According to Facility Output

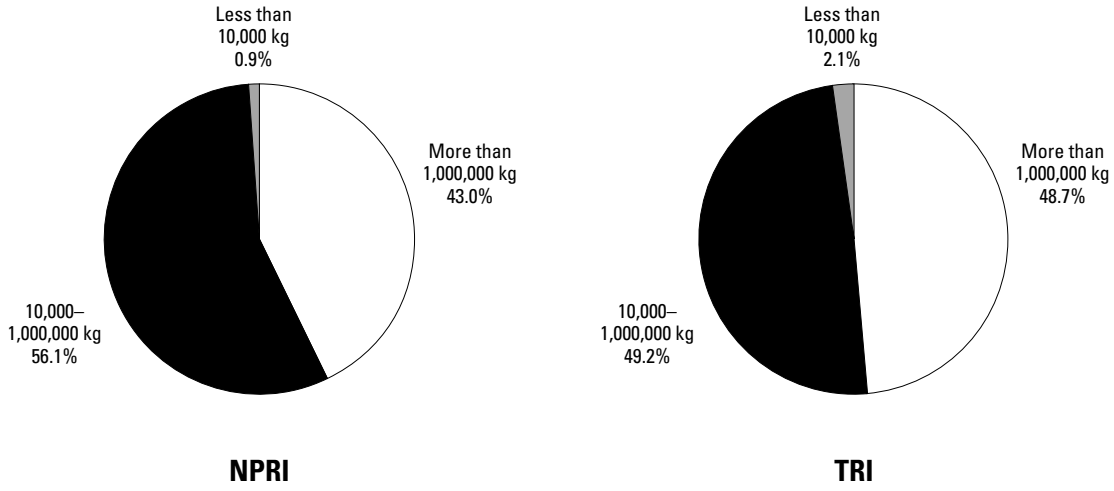


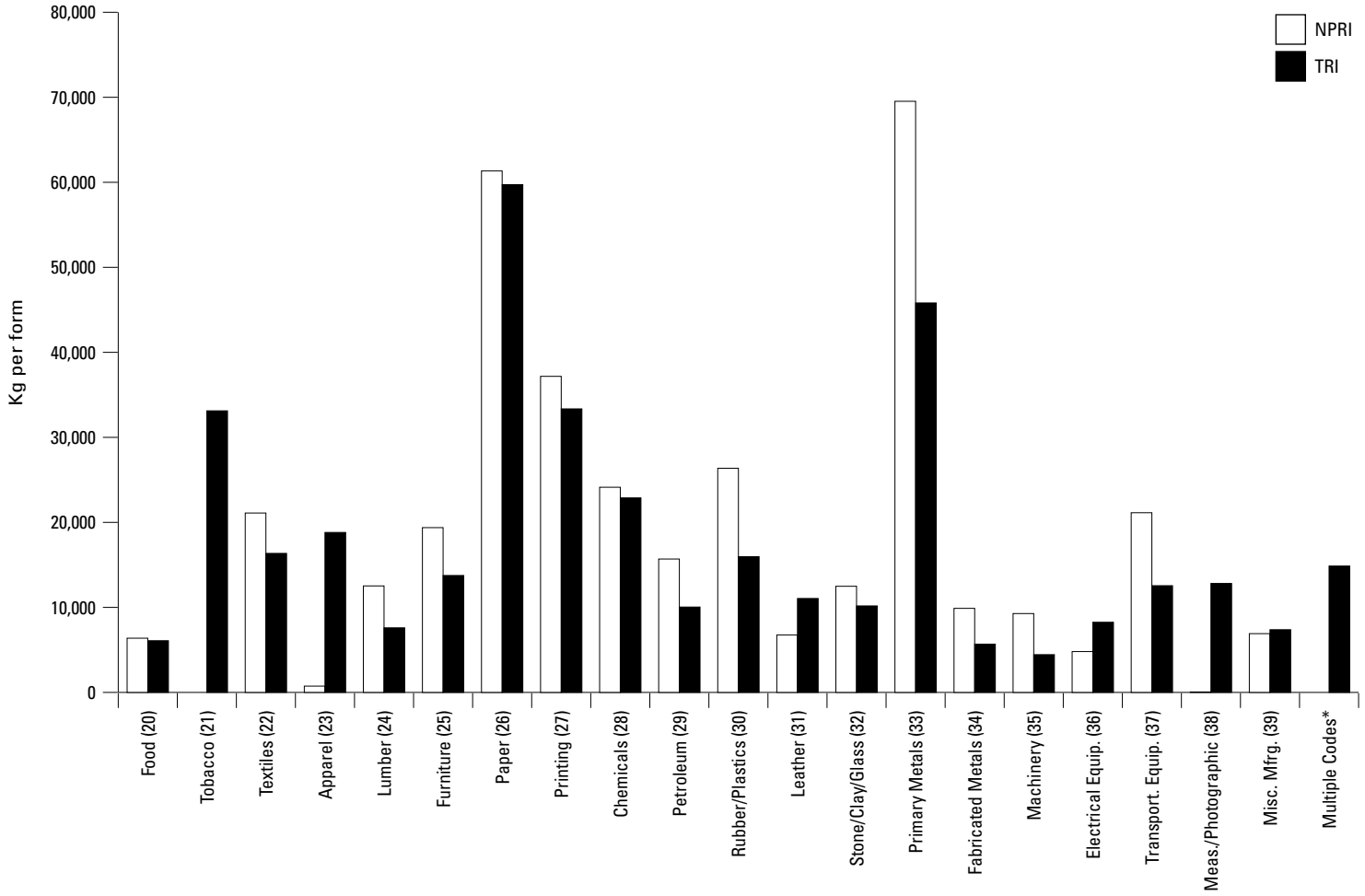
Table 5–48
M 1996

Distribution of NPRI and TRI Total Releases and Transfers and Facilities

	NPRI		TRI	
Quantity per Facility	Number of Facilities	Total Releases and Transfers (kg)	Number of Facilities	Total Releases and Transfers (kg)
Greater than 4,000,000 kg	5	22,666,346	32	250,295,422
From 1,000,000 kg to 4,000,000 kg	16	30,708,620	156	286,460,332
From 100,000 kg to 1,000,000 kg	196	57,289,273	1,287	383,045,898
From 10,000 kg to 100,000 kg	344	12,300,870	4,761	158,516,995
From 1,000 kg to 10,000 kg	243	1,064,977	4,933	22,054,747
From 1 kg to 1,000 kg	321	99,048	5,001	1,328,152
0 kg	219	0	3,020	0
Total	**1,344**	**124,129,147**	**19,190**	**1,101,701,543**
	% of Total	**% of Total**	**% of Total**	**% of Total**
Greater than 4,000,000 kg	0.4	18.3	0.2	22.7
From 1,000,000 kg to 4,000,000 kg	1.2	24.7	0.8	26.0
From 100,000 kg to 1,000,000 kg	14.6	46.2	6.7	34.8
From 10,000 kg to 100,000 kg	25.6	9.9	24.8	14.4
From 1,000 kg to 10,000 kg	18.1	0.9	25.7	2.0
From 1 kg to 1,000 kg	23.9	0.1	26.1	0.1
0 kg	16.3	0.0	15.7	0.0
Total	**100.0**	**100.0**	**100.0**	**100.0**

Figure 5–20
M 1996

Total Releases and Transfers per Form by Industry, NPRI and TRI



* Multiple SIC codes reported only in TRI data.

Table 5–49
M 1996

Average Total Releases and Transfers per Form, by Industry, NPRI and TRI

Rank	US SIC Code	Industry	NPRI (kg/form)	TRI (kg/form)	Ratio of Average per Form (NPRI/TRI)
1	35	Industrial Machinery	9,275	4,440	2.1
2	34	Fabricated Metals Products	9,887	5,679	1.7
3	37	Transportation Equipment	21,135	12,554	1.7
4	30	Rubber and Plastics Products	26,366	15,966	1.7
5	24	Lumber and Wood Products	12,526	7,595	1.6
6	29	Petroleum and Coal Products	15,690	10,043	1.6
7	33	Primary Metal Industries	69,530	45,812	1.5
8	25	Furniture and Fixtures	19,383	13,752	1.4
9	22	Textile Mill Products	21,101	16,352	1.3
10	32	Stone/Clay/Glass Products	12,485	10,175	1.2
11	27	Printing and Publishing	37,178	33,352	1.1
12	28	Chemicals	24,133	22,880	1.1
13	20	Food Products	6,376	6,079	1.0
14	26	Paper Products	61,335	59,731	1.0
15	39	Misc. Manufacturing Industries	6,913	7,374	0.9
16	31	Leather Products	6,750	11,047	0.6
17	36	Electronic/Electrical Equipment	4,805	8,249	0.6
18	23	Apparel and Other Textile Products	740	18,818	0.0
19	38	Measurement/Photographic Instruments	55	12,816	0.0
	21	Tobacco Products	—	33,122	—
		Multiple Codes 20-39*	—	14,862	—
		Total	**28,881**	**19,019**	**1.5**

* Multiple SIC codes reported only in TRI data.

Table 5–50
M 1996

Total Releases and Transfers for the Primary Metals Products Industry (US SIC Code 33)

US SIC Code	Industry	NPRI Number of Forms	NPRI % of All Forms	NPRI Total Releases and Transfers (kg)	NPRI % of All kg	NPRI Average per Form (kg/form)	TRI Number of Forms	TRI % of All Forms	TRI Total Releases and Transfers (kg)	TRI % of All kg	TRI Average per Form (kg/form)	Ratio of Average per Form (NPRI/TRI)
331	Blast furnace and basic steel products	194	32.9	25,496,521	62.3	131,425	1,680	28.4	102,878,034	38.0	61,237	2.1
332	Iron and steel foundries	61	10.4	4,180,957	10.2	68,540	1,111	18.8	22,276,436	8.2	20,051	3.4
333	Primary nonferrous metals	148	25.1	8,969,301	21.9	60,603	204	3.4	84,275,559	31.1	413,115	0.1
334	Secondary nonferrous metals	23	3.9	475,453	1.2	20,672	497	8.4	11,248,721	4.2	22,633	0.9
335	Nonferrous rolling and drawing	85	14.4	335,825	0.8	3,951	993	16.8	10,217,451	3.8	10,289	0.4
336	Nonferrous foundries	44	7.5	83,287	0.2	1,893	635	10.7	2,001,826	0.7	3,152	0.6
339	Miscellaneous primary metal products	34	5.8	1,411,864	3.4	41,525	310	5.2	1,747,190	0.6	5,636	7.4
	Multiple codes within SIC 28*	—	—	—	—	—	483	8.2	36,377,632	13.4	75,316	—
	SIC code not valid within SIC 28	—	—	—	—	—	3	0.1	361	0.0	120	—
	Total	**589**	**100.0**	**40,953,208**	**100.0**	**69,530**	**5,916**	**100.0**	**271,023,208**	**100.0**	**45,812**	**1.5**

* Multiple SIC codes reported only in TRI data.

Table 5–51
M 1996

Total Releases and Transfers for the Chemical Industry (US SIC Code 28)

US SIC Code	Industry	NPRI Number of Forms	NPRI % of All Forms	NPRI Total Releases and Transfers (kg)	NPRI % of All kg	NPRI Average per Form (kg/form)	TRI Number of Forms	TRI % of All Forms	TRI Total Releases and Transfers (kg)	TRI % of All kg	TRI Average per Form (kg/form)	Ratio of Average per Form (NPRI/TRI)
281	Industrial inorganic chemicals	211	15.4	7,927,242	24.0	37,570	1,035	6.4	29,104,760	7.8	28,121	1.3
282	Plastics materials and synthetics	193	14.1	6,668,615	20.2	34,552	1,762	10.9	33,811,159	9.1	19,189	1.8
283	Pharmaceuticals	31	2.3	1,381,316	4.2	44,559	539	3.3	21,243,497	5.7	39,413	1.1
284	Soap, cleaners and toilet goods	121	8.9	54,536	0.2	451	840	5.2	944,554	0.3	1,124	0.4
285	Paints and allied products	352	25.7	3,973,313	12.0	11,288	2,547	15.7	5,527,847	1.5	2,170	5.2
286	Industrial organic chemicals	217	15.9	9,253,052	28.0	42,641	2,707	16.7	88,590,755	23.9	32,727	1.3
287	Agricultural chemicals	61	4.5	2,819,028	8.5	46,214	742	4.6	15,080,854	4.1	20,325	2.3
289	Miscellaneous chemical products	181	13.2	912,878	2.8	5,044	1,642	10.1	12,757,188	3.4	7,769	0.6
	Multiple codes within SIC 28*	—	—	—	—	—	4,409	27.2	164,183,953	44.2	37,238	—
	SIC code not valid within SIC 28	—	—	—	—	—	4	0.0	21,928	0.0	5,482	—
	Total	**1,367**	**100.0**	**32,989,980**	**100.0**	**24,133**	**16,227**	**100.0**	**371,266,495**	**100.0**	**22,880**	**1.1**

* Multiple SIC codes reported only in TRI data.

Table 5–52
M 1996

Total Releases and Transfers for the Paper Products Industry (US SIC Code 26)

US SIC Code	Industry	NPRI Number of Forms	NPRI % of All Forms	NPRI Total Releases and Transfers (kg)	NPRI % of All kg	NPRI Average per Form (kg/form)	TRI Number of Forms	TRI % of All Forms	TRI Total Releases and Transfers (kg)	TRI % of All kg	TRI Average per Form (kg/form)	Ratio of Average per Form (NPRI/TRI)
261	Pulp mills	206	65.0	14,824,237	76.2	71,962	177	8.9	12,922,142	10.9	73,006	1.0
262*	Paper mills	63	19.9	1,199,582	6.2	19,041	389	19.7	18,407,550	15.6	47,320	0.4
263	Paperboard mills	10	3.2	501,934	2.6	50,193	252	12.7	18,649,691	15.8	74,007	0.7
265	Paperboard boxes	2	0.6	62,730	0.3	31,365	35	1.8	254,394	0.2	7,268	4.3
267**	Misc. converted paper products	36	11.4	2,854,662	14.7	79,296	341	17.2	10,101,883	8.6	29,624	2.7
	Multiple codes within SIC 26***	—	—	—	—	—	784	39.6	57,812,002	48.9	73,740	—
	Total	**317**	**100.0**	**19,443,145**	**100.0**	**61,335**	**1,978**	**100.0**	**118,147,663**	**100.0**	**59,731**	**1.0**

* Includes 266 which was changed to 262 in 1987.

** Includes 264 which was changed to 267 in 1987.

*** Multiple SIC codes reported only in TRI data.

Investigation of Differences in Average Releases and Transfers per Form

Tables in this report show that the NPRI average per form is 1.5 times greater than that in TRI. To examine the differences between these averages two chemicals—methanol and methyl ethyl ketone (MEK)—were examined as case studies.

These two chemicals were chosen because they are major commercial chemicals used in a variety of industrial processes and represent significant portions of the total releases and transfers reported in each country. Methanol is the chemical with the largest total releases and transfers in both NPRI and TRI and MEK ranks among the top ten in each. For both chemicals, the average total releases and transfers per form in NPRI are higher than in TRI.

Several factors that could influence the reported differences were investigated including industry characteristics and differences in reporting methods. Industry characteristics that may differ between the two countries are industrial sectors reporting the chemical, production capacity within industrial sectors, and pollution prevention and control systems in use at the industrial facilities. Differences in reporting methods include methods of preparing the estimates of the amounts and differences in thresholds for reporting.

The case studies found that the key factors contributing to the differences between the NPRI and TRI average releases and transfers per form are:

- industry structure differences and associated facility capacity differences, and
- levels of pollution prevention and controls under different regulatory requirements in different jurisdictions.

Not every industy sector reporting releases and transfers of methanol and MEK has larger averages per form in NPRI than in TRI. For those sectors that do, there are often a small number of facilities in the NPRI that account for a large portion of the total releases and transfers reported in the sector. For example, in the case of methanol releases and transfers for the chemical manufacturing sector, the study examined methanol manufacturing facilities, the largest contributing source. (In some of these facilities, methanol releases also come from integrated acetic acid operations). The three NPRI methanol manufacturing facilities (one of which has an integrated acetic acid operation) have an average methanol production capacity of 840,000 tonnes per facility. The 15 methanol facilities reporting to the TRI (some with integrated acetic acid operations) have an average methanol production capacity of 472,000 tonnes per facility. The largest total releases and transfers reported from an NPRI methanol facility were 2,600 tonnes, while none of the TRI methanol facilities reported total releases and transfers greater than 1,000 tonnes. In addition to the higher capacity of NPRI facilities, the case study also suggests that NPRI methanol facilities have higher methanol releases from storage and loading, since most Canadian methanol is exported. In contrast, there is a higher degree of pipeline integration between TRI methanol facilities and methanol derivative product manufacturing facilities. Another factor was that some US jurisdictions (states, counties) have VOC control regulations that require vapor control systems at TRI facilities. These types of differences were found in several other industrial subsectors. For methanol, these included: fertilizer production, petroleum refining, panelboard mills, and flat glass manufacturing. For MEK, these included: vinyl sheet manufacturing and wallpaper production.

Other factors investigated were:

- differences in the thresholds for reporting and
- methods used to estimate amounts of PRTR emissions.

These factors were found not to explain many of the differences or to contribute to a reverse ratio of average per form. Thresholds for reporting to TRI are somewhat lower than for reporting to NPRI. While there are proportionately more TRI facilities with the lowest (but non-zero) amounts of total releases and transfers, the distribution of total releases and transfers in NPRI is weighted toward more forms with zero total releases and transfers than in TRI, but the difference is slight. On the other hand, NPRI has a greater proportion of forms from facilities in the higher range (greater than 1,000 tonnes of releases and transfers on a form). Thus, NPRI tends to have relatively few facilities reporting the largest amounts, as explained in the above example.

One significant source of releases and transfers of methanol is the kraft paper mill sector. In this case, NPRI average total releases and transfers were lower than those from TRI (ratio of 0.6). Several factors were found to contribute to this exception to the pattern of higher NPRI averages. No TRI mill reported methanol releases of zero or less than 10 tonnes while one fourth of the NPRI kraft mills did. The factors seen to play a role in the differences for kraft paper mills were higher average kraft pulp mill capacity for TRI facilities and the emissions factors used by many TRI mills to estimate total releases and transfers were revised since 1994 with the resulting amounts generally increasing. Some of the NPRI facilities were still using the older emission factors.

The case studies of the two chemicals, methanol and methyl ethyl ketone, have helped to illuminate what factors may be operating in the two countries to contribute to the differences observed in this report. The case studies also show the need to keep in mind these factors and how they may vary depending on the facilities, industries and chemicals being compared.

Source: "Analysis of Differences between the Canadian NPRI and the United States TRI Releases and Transfers per Form: Case Studies on Reported NPRI and TRI Releases and Transfers of Methanol and Methyl Ethyl Ketone," prepared by Cheminfo Services, Inc. for the Commission for Environmental Cooperation, February 1999.